FEDERAL AVIATION ADMINISTRATION

EASTERN REGION
AIRPORTS DIVISION

Environmental Assessment

For

New Jersey Department of Transportation
South Jersey Regional Airport
Widening of Runway 08-26 and Ancillary Improvements

Lumberton Township
Burlington County, New Jersey

October 2018

Prepared by

AECOM

"This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official."

Responsible FAA Official

11/19/2018
Date

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Acronyms

AC	Advisory Circular
ACEIT	Airport Construction Emissions Inventory Tool
ACHP	Advisory Council on Historic Preservation
ACRP	Airport Cooperative Research Program
ALP	Airport Layout Plan
AMNET	Ambient Biomonitoring Network
AOC	Areas of Concern
APE	Area of Potential Effects
APU	Auxiliary Power Units
AQCR	Air Quality Control Region
ARC	Airport Reference Code
ASZ	Airport Safety Zone
BMPs	Best Management Practices
C-2	Category Two
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAFRA	Coastal Area Facility Review Act
CBRA	Coastal Barrier Resources Act
CEA	Classification Exception Area
CEQ	Council on Environmental Quality
CKE	Currently Known Extent
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAP	Diffuse Anthropogenic Pollution
dB	Decibel
DLUR	Division of Land Use Regulation
DNL	Day-Night Average Sound Level
DVRPC	Delaware Valley Regional Planning Commission
EA	Environmental Assessment
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIC	Federal Interagency Committee
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
GCR	General Conformity Rule
GHG	Greenhouse Gases
GIS	Geographic Information System
GSE	Ground Support Equipment
HAP	Hazardous Air Pollutants
HASP	Health and Safety Program
IPaC	Information for Planning and Consultation

LED	Light-Emitting Diodes
LOD	Limits of Disturbance
LOI	Letter of Interpretation
LSRP	Licensed Site Remediation Professional
MIRL	Medium Intensity Runway Lights
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NJDEP	New Jersey Department of Environmental Protection
NJDFW	New Jersey Division of Fish and Wildlife
NJDOT	New Jersey Department of Transportation
NJPDES	New Jersey Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NPIAS	National Plan of Integrated Airport Systems
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide River Inventory
NT	Non-Trout
OFA	Object Free Area
PAPI	Precision Approach Path Indicators
PCBs	Polychlorinated Biphenyls
PMI	Pinelands Macroinvertebrate Index
RASP	Regional Aviation System Plan
REILS	Runway End Identifier Lights
RGA	Richard Grubb & Associates
ROFA	Runway Object Free Area
RSA	Runway Safety Area
SASP	State Airport System Plan
SHPO	State Historic Preservation Office
SIP	State Implementation Plans
SOP	Standard Operating Procedure
SPPP	Stormwater Pollution Prevention Plan
SSA	Sole Source Aquifer
SWQS	Surface Water Quality Standards
TDR	Transfer of Development Rights
TMDLs	Total Maximum Daily Loads
TRB	Transportation Research Board
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
VOR	Very High Frequency Omnidirectional Range
WMA	Watershed Management Area

Executive Summary

In accordance with Federal Aviation Administration (FAA) policies and procedures for implementing the National Environmental Policy Act (NEPA), including FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions, and FAA Order 1050.1E, Change 1, Environmental Impacts: Policies and Procedures, this Environmental Assessment (EA) analyzes the potential effects of the Widening of Runway 08-26 and Ancillary Improvements project at the South Jersey Regional Airport (the Proposed Action) to determine if the Proposed Action is likely to significantly affect the environment and warrant preparation of an environmental impact statement, or whether it is appropriate for the FAA to prepare a Finding of No Significant Impact for the project.

In order to maintain safe and efficient airport operations, the New Jersey Department of Transportation (NJDOT) proposes to modify Runway 08-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet current and future Runway to Taxiway Separation standards. . The Proposed Action would not increase the capacity of the airport or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways.

The major elements of the project include:

- Widen Runway 08-26 from 50’ to 60’
- Regrade Runway 08-26 and the surrounding Runway Safety Area (RSA)
- Provide 10’ turf shoulders along the runway
- Provide 15’ turf shoulders along the taxiway
- Clear the surrounding runway Object Free Area (OFA) including tree removal to the degree practicable
- Widen parallel taxiway “A” from approximately 20’ to 35’
- Relocate taxiway “A” centerline 240’ off the runway centerline and extend the connecting taxiways
- Relocate the segmented circle and wind cone

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing (five, 48” corrugated metal pipes [CMPs]) culvert crossing of Masons Creek with a three-sided rigid frame structure
- Demolition/removal of existing Taxiway “A” pavement
- Runway/taxiway lighting and markings
- Trenching for buried utilities

Alternatives Development

The Proposed Action would bring the airport closer to FAA standards, while minimizing the environmental impacts to the greatest degree practicable. The Proposed Action would satisfy the project purpose and need.

Under the No-Action Alternative, the Proposed Action would not be implemented; therefore, creating no new environmental impacts. However, the safety and efficiency of the airfield would not be improved and the project purpose and need would not be met.

Various design alternatives were created and dismissed due to their negative environmental impact, cost or inability to meet the project purpose and need. Alternatives considered included relocating the airfield and associated operations to a different location and closing VAY, and relocating the runway to a new location. Relocating the airport was dismissed as the cost and environmental impacts would far exceed the Proposed Actions. Various potential runway locations were evaluated but dismissed due to cost, increased environmental impacts and/or inability to construct the improvements within the necessary timeframe.

Agency Coordination and Public Involvement

Throughout the NEPA and planning process for the Proposed Action, NJDOT has consulted with various federal, state and local agencies including the Township of Lumberton, New Jersey Department of Environmental Protection, New Jersey State Historic Preservation Office, U.S. Fish and Wildlife Service, as well as the public in order to understand concerns and interests of these stakeholders and to take their concerns into consideration throughout the process.

Affected Environment

This EA identifies and describes the reasonably foreseeable environmental consequences of the Proposed Action and No-Action Alternatives. The focus of the analysis is on resources that would be affected by the Proposed Action, and mitigation measures to reduce adverse effects that cannot be avoided if the Proposed Action is implemented. Table ES-1 below summarizes the effects of the Proposed Action on the natural and built environment and lists the commitments to minimize and mitigate the effects of implementing the Proposed Action.

Balancing Benefits and Effects

During the EA process, NJDOT refined the Proposed Action where reasonably feasible to avoid or minimize effects. Yet some adverse effects would occur due to the design and safety standards VAY must meet. Throughout the EA process, NJDOT has worked to balance the trade-offs between the benefits and the effects of the Proposed Action.

On the benefits side, the Proposed Action would provide the safety benefits that achieve the project purpose and need. This includes bringing both the runway and parallel taxiway up to current FAA Standards in width and separation along with proper grading of the runway and surrounding Runway Safety Area (RSA), as well as the replacement of the existing (five, 48" CMPs) culvert crossing of Masons Creek with a three-sided rigid frame structure to accommodate peak flows of the NJ Flood Hazard Area design storm flood of Masons Creek beneath the runway.

Unavoidable impacts as a result of the Proposed Action are primarily temporary in relation to construction activities. Minimization and avoidance of impacts will be implemented to the greatest degree practicable. The main area of impacts will occur to water resources and biotic resources on the project site due to in-water work within Masons Creek, as well as tree clearing and ground disturbance within wetlands and riparian zones. The proper permits will be obtained and corresponding mitigation measures for unavoidable impacts will be implemented.

TABLE ES-1
Summary of Environmental Consequences and Impact Avoidance, Minimization and Mitigation Measures

Affected Environment	Environmental Consequences		Impact Avoidance, Minimization and Mitigation
	Proposed Action	No-Action Alternative	
Air Quality	– No operational impacts – Minimal temporary construction impacts	None	– Abide by applicable NJDEP recommendations regarding mobile source emissions during the construction period
Biological Resources	– Temporary disturbance to wildlife, project would not result in any long term or permanent loss of plant or wildlife populations – No long-term or short-term impacts to aquatic biota and fishery resources are expected – Potential impacts to the State Endangered upland sandpiper due to grassland habitat disturbance – Potential impacts to the Federally Threatened northern long-eared bat and migratory/nesting bird species due to tree clearing activities – Not likely to adversely affect bog turtles	None	– Limit taxiway length to avoid crossing Masons Creek with permanent in-water structures – Limit clearing of trees and shrubs within the Runway Object Free Area to minimize impacts to sensitive resources along Masons Creek and associated tributaries – Minimize area of disturbance of project to the minimum practicable – Avoid introduction of invasive species – Abide by seasonal restrictions for certain activities related to threatened and endangered species – Abide by seasonal restrictions for certain activities to protect fisheries resources and nesting bird species – Implement spill prevention and cleanup plan, apply soil erosion and sediment control measures – Provide water quality and Stormwater management enhancements for the project
Climate	– No new permanent sources of GHG emissions – Temporary construction related GHG emissions – Raising elevation of Runway around Masons Creek above 100-year flood elevation for Masons Creek would help combat Risks from Climate Change	– Runway will remain within 100-year floodplain of Masons Creek – No change in GHG emissions	– Use of efficient machinery and vehicles during construction – Powering down of idling construction equipment and vehicles when feasible
Coastal Resources	None	None	None
Section 4(f)	None	None	None
Farmlands	– No acquisition, or use of protected farmland	None	None
Hazardous Materials, Solid Waste and Pollution Prevention	– No long-term operational impacts related to hazardous materials or solid waste anticipated – Short term construction impacts are not anticipated to be adverse, but may include potential health and safety risks, generation of waste material and potential for waste related to excavation of questionable soils	None	– Restriction of public access during construction – Implementation of dust control measures – Development and adherence to a Site-Specific Health and Safety Program – LSRP oversight if contamination is encountered during construction – Adherence to materials handling plans and pollution prevention and control plans

TABLE ES-1 (continued)
Summary of Environmental Consequences and Impact Avoidance, Minimization and Mitigation Measures

Affected Environment	Environmental Consequences		Impact Avoidance, Minimization and Mitigation
	Proposed Action	No-Action Alternative	
Historic, Architectural and Cultural Resources	– No historic architectural or archaeological resources affected	None	– Avoidance of construction impacts to identified archaeological site via substantial fencing. – Permanent survey markers will be installed to assist with accurate relocation of the site in the future. – The Pre-Contact site identified during the September-October 2017 survey work will be registered with the New Jersey State Museum.
Land Use	None	None	None
Natural Resources, Energy Supply and Sustainable Design	– No significant changes to energy facilities, daily energy or fuel consumption – Construction related energy and fuel consumption – Use of high efficiency LED lighting which will consume less energy than the existing airfield lighting system will provide a net beneficial impact	None	None
Noise and Noise-Compatible Land Use	– No operational impacts – Minimal temporary construction impacts	None	None
Socioeconomics, Environmental Justice and Children's Health and Safety Risks	None	None	None
Visual Resources	– Temporary construction related impacts	None	None
Water Resources	– Impacts to wetlands (+/- 3.5 acres) as well as impacts to State open waters and floodplains – Increase in impervious surfaces by 1.9 acres – Construction related sedimentation due to earth work	None	– Limit taxiway length to avoid crossing Masons Creek with permanent in-water structures – Limit clearing of trees and shrubs within the Runway Object Free Area to minimize impacts to sensitive resources along Masons Creek and associated tributaries – Minimize in-water construction to fullest extent possible – Minimize the area of construction disturbance to the fullest extent practicable – Provide water quality and Stormwater management enhancements for the project – Apply standard soil erosion and sediment control measures – Implement a spill prevention and cleanup plan – Monitor excavations for the presence of acid- producing soils during construction – Obtain appropriate permits, comply with permit conditions and provide necessary mitigation for permanent impacts

1.0 Introduction

This Environmental Assessment (EA) analyzes the potential effects associated with the construction and operation of proposed improvements to the existing runway and taxiways at the South Jersey Regional Airport (VAY). The project is sponsored by the New Jersey Department of Transportation (NJDOT).

This EA has been prepared in accordance with Federal Aviation Administration (FAA) Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions; FAA Order 1050.1F, Environmental Impacts: Policies and Procedures; and using the 1050.1F Desk Reference manual for additional technical guidance. Compliance with these orders and guidance ensures that the proposed federal action meets procedural and substantive requirements set forth by the Council on Environmental Quality (CEQ) in its regulations implementing the National Environmental Policy Act of 1969 (NEPA), as amended (40 CFR 1500-1508).

1.1 The Airport

NJDOT (the Sponsor) is proposing to undertake an airfield safety improvement project at VAY. The airport is located along Stacy Haines Road in Lumberton Township, Burlington County, New Jersey. Neighboring townships include Hainesport to the north, Medford to south and Mount Laurel to the west (Figure 1.1-1).

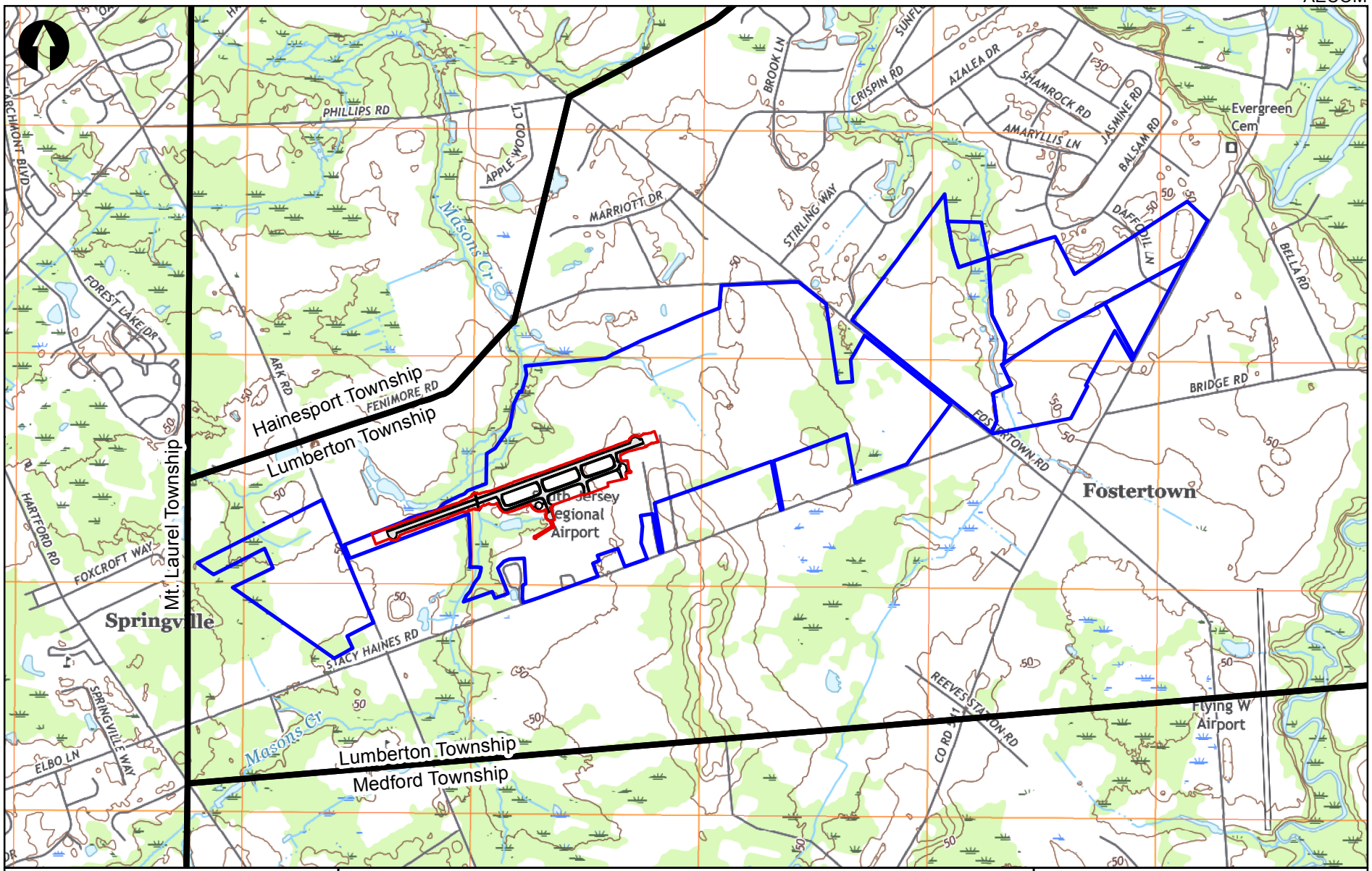
VAY is a public-use general aviation airport owned by the NJDOT and operated locally by Flight 114, LLC. The 658-acre airport has one paved runway, designated Runway 08-26 (east-west), and a partial parallel taxiway, designated Taxiway "A." The terminal area is located on the south side of the runway and includes aircraft tie-down aprons, two rows of T-hangars, two fixed base operator (FBO) hangars for aircraft storage and maintenance, a transient aircraft parking apron, and the Air Victory Museum. A second, smaller FBO is located on the east side of the airport near the approach to Runway End 26 (Figure 1.1-2).

Aircraft activity at VAY is dominated by single engine and small twin engine piston powered airplanes with occasional operations by larger turboprops including transient air taxi and military types. Helicopter operations include Philadelphia television stations and hospital medivac flights. The airport does not cater to corporate flight operations as do the larger airports, although small business jets operate occasionally. According to the FAA Terminal Area Forecast (TAF), there are approximately 100 based aircraft and approximately 23,000 operations annually.

1.2 Airport Master Plan/ALP Update

All airports are recommended to have an Airport Master Plan. In addition, all federally-obligated airports are required to have an Airport Layout Plan (ALP). An Airport Master Plan is a comprehensive study of the airside and landside facilities at an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand. An ALP is a set of drawings that graphically depict the existing and future facilities at the airport and is typically supported by the analysis, findings, and recommendations presented in the Master Plan.

South Jersey Regional Airport's Master Plan and corresponding ALP were updated in 2015 (AECOM, 2015). These plans focus on four phases of development—Phase I (0-5 years), Phase II (6-10 years), Phase III (11-20 years), and the "Future" Plan for improvements and changes to the airport (21 years and beyond). Projects included in each phase are based on prioritization, sequencing, and a comprehensive master schedule that reflects the NJDOT's overall financial, environmental, and strategic plans for VAY.



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Feet

Legend

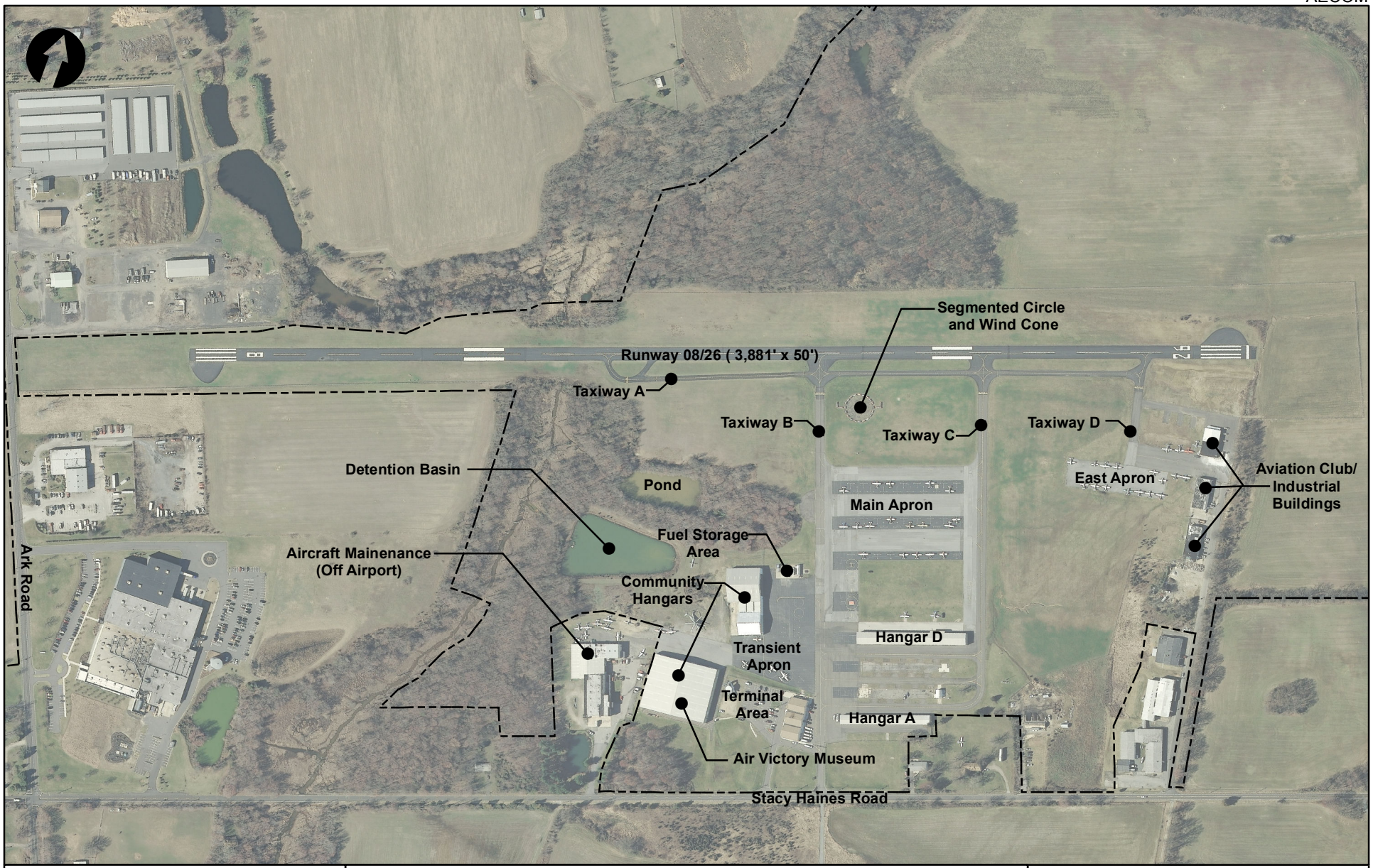
- Project Area
- Airport Property

Project Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USGS Mount Holly US Topographic 7.5' quadrangle

Figure 1.1-1



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Legend

Airport Property

Facilities

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 1.1-2

This EA covers the airside projects identified in Phase I of the Airport Master Plan/ALP. These are the highest priority projects that are needed to address specific safety issues related to the existing runway and taxiways, as discussed below. Landside projects identified in Phase I are unrelated to the proposed project or action; therefore; they are not covered in this EA. Future projects identified in subsequent development phases are also not included in this EA. Those projects will require their own NEPA evaluation if and when they are ready for FAA review and approval.

1.3 Airport Design Standards

The FAA publishes airport design standards for various airport-related equipment, facilities, and structures. Advisory Circular 150/5300-13A, Airport Design, provides standards for planning, design, and protection of airfield runways, taxiways, and ancillary facilities including aircraft parking aprons, navigational aids, air traffic control facilities, and so on. These standards provide basic guidelines for a safe, efficient, and economic airport system and they serve as the basis for preparing Airport Master Plans and ALPs to meet FAA requirements.

Airports are designed to accommodate aircraft expected to use the airport on a regular basis. The characteristics of the "design aircraft" influence the geometric design aspects of runways, taxiways, ramps, aprons, servicing facilities, etc. Building to the FAA's airport design standards ensures that the design aircraft and similar types of aircraft can operate at the airport without restrictions or location specific encumbrances that could impact safe and efficient operations.

According to the South Jersey Regional Airport Master Plan Update, the FAA-approved design aircraft for VAY is a composite aircraft representing a collection or group of single engine and twin engine airplanes with similar size and performance characteristics. The design aircraft for VAY includes all airplanes with approach speeds of 91 knots or more but less than 121 knots (Approach Category B) and wingspans of 49' or less (Design Group I). This group of airplanes is categorized as Airport Reference Code (ARC) B-I and determines the minimum design standards for the runway and parallel taxiway with regard to landing operations.

Aircraft larger than B-I also use VAY occasionally. These are transient turboprops and small business jets with wider wingspans that fall into the B-II category (49' < 79' wingspans). These aircraft do not use VAY on a regular basis but they may in the future.

Aircraft operations cannot be prevented, regulated, or controlled simply because the airport or the runway does not meet the design standards for a particular type of aircraft. Therefore, every effort should be made to bring an airport up to the applicable standards. Where airport design standards are not achieved, the FAA may consider alternative means of ensuring an acceptable level of safety. This is usually a standard operating procedure (SOP) put in place to ensure safety, even if the SOP results in a reduction in efficiency.

1.4 Non-Standard Conditions and Corrective Actions

The Airport Master Plan/ALP identifies numerous design deficiencies or "non-standard conditions" associated with the existing runway and taxiway system at VAY. In general, the runway and taxiway pavements are not wide enough, the runway and parallel taxiway are located too close together, and the runway has high and low elevations that need to be corrected to provide a more flat or level surface for aircraft takeoff and landing. In addition, several areas surrounding the runway are not adequately cleared or graded to meet airfield safety standards.

These non-standard conditions are identified and addressed in the Airport Master Plan/ALP along with the Proposed Action to be taken to correct the situation. As discussed below, the proposed project that is addressed in this EA would bring the runway elements of the project up to FAA design standards for B-I aircraft that use VAY on a regular basis, and bring the taxiway elements of the project up to FAA design standards for the larger transient (B-II) aircraft that use the airport occasionally.

1.4.1 Runway Surface Gradient

Runway pavements must be sloped to provide an adequate crown for drainage and to minimize changes in elevation along the runway centerline. The existing runway does not meet the FAA standard in all locations. According to the Airport Master Plan/ALP, the two areas of most concern are 1) a low point where the runway pavement has settled nearly 5' over Masons Creek and 2) a high point near the east end of the runway.

B-I Standard	Existing Condition	Proposed Action
Longitudinal grade ±2% Transverse grade 1% to 2%	Longitudinal grades >5%	Regrade Runway 08-26 as needed to comply with FAA standards

1.4.2 Runway Width

The width of a runway is dependent on the normal prevalent visibility, maneuverability, and stability of the design aircraft during landing. The minimum pavement width requirement for any airport runway regardless of aircraft size is no less than 60'.

B-I Standard	Existing Condition	Proposed Action
60'	50'	Widen Runway 08-26 to 60'

1.4.3 Runway Shoulder Width

This is the surface area immediately beyond the defined edge of runway pavement that is prepared to provide a transition between the pavement and the adjacent surface. Shoulders must be capable of supporting the design aircraft as well as emergency and maintenance vehicles, sloped to enhance drainage, and covered with dense turf to provide blast protection.

B-I Standard	Existing Condition	Proposed Action
10'	Shoulder width deficiencies	Provide 10' turf shoulders along both sides of the runway

1.4.4 Runway Safety Area

The RSA is a defined area or surface surrounding the runway that is prepared or suitable for reducing the risk or damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The existing RSA does not meet the FAA's dimensional or grading standards in all locations. The two areas of concern are 1) where Masons Creek is culverted beneath the runway and 2) beyond the east end of the runway.

B-I Standard	Existing Condition	Proposed Action
120' wide 240' beyond each runway end	<120' <240'	Regrade the RSA to the dimensional standard

1.4.5 Runway Object Free Area

The OFA is a defined area surrounding the runway that must be maintained free of objects (e.g., trees, roads, buildings, poles, etc.) except for objects that need to be located in the object free area for air navigation or aircraft ground maneuvering purposes. The existing OFA does not meet the FAA's dimensional standard in all locations along the runway. The areas of concern are forested areas located along the north and south sides of the runway near Masons Creek.

B-I Standard	Existing Condition	Proposed Action
400' wide 240' beyond each runway end	Trees penetrate the OFA	Clear the OFA to the extent practicable

Environmental constraints north and south of Runway 08/26 do not allow for the OFA to be entirely cleared of obstacles. Masons Creek and associated forested wetlands and riparian zones are all located within the OFA. The existing airport security fence also protrudes into the OFA by approximately 10 feet, with its relocation limited due to environmental constraints. All obstacles outside of regulated areas will be removed; however, clearing the entire OFA would come at high environmental and monetary costs. If the entire OFA were to be cleared it would result in 1.2 acres of riparian zone impacts and 1.9 acres of freshwater wetland impacts, both of which would require extensive mitigation measures. Considering the OFA penetrations are an existing condition, a modification to the design standards is being sought.

1.4.6 Runway/Parallel Taxiway Centerline Separation

Runways and taxiways must be adequately separated to provide safe distances between aircraft operations. There is currently less than 75' separation between the centerlines of Runway 08-26 and the parallel taxiway when a minimum of 225' separation is required. Consequently, aircraft are not permitted on Taxiway "A" when Runway 08-26 is in use. This SOP is in place to maintain safety but it also reduces efficiency by increasing runway/taxiway occupancy time during takeoff and landing operations.

Runway to taxiway separation for the B-I standard is 225', compared to 240' for the B-II standard. According to the Airport Master Plan/ALP, the proposed runway and parallel taxiway centerline separation is 240' to meet future separation requirements (i.e., it is recommended to build the taxiway where it needs to be in the future to avoid having to relocate it again). Until then, the added 15' separation beyond the B-I requirement would enhance operational safety by meeting the design standard for the larger transient (B-II) aircraft that use VAY occasionally.

B-I / B-II Standard	Existing Condition	Proposed Action
225' / 240'	74'	Relocate Taxiway "A" to provide 240' runway to parallel taxiway centerline separation

1.4.7 Taxiway Width

Pavement width requirements for taxiing airplanes are based on the dimensions of the design aircraft's undercarriage or characteristic turning movements. In addition, all taxiways must be designed and constructed to comply with applicable standards for pavement fillets, taxiway safety areas, taxiway object free areas, shoulders, edge safety margins, pavement edge lighting, and markings.

The existing parallel Taxiway "A" width is ±20'. The FAA standard is 25' for the current design aircraft (B-I), and 35' for the future design craft (B-II). Similar to the proposed B-II taxiway separation, it is recommended to build the taxiway at the width it needs to be in the future to avoid having to widen it. Until then, the added 10' taxiway width beyond the B-I requirement would enhance operational safety by meeting the design standard for the larger transient (B-II) aircraft that use VAY occasionally.

B-I / B-II Standard	Existing Condition	Proposed Action
25' / 35'	±20'; deficient taxiway width, geometry, and clearances	Provide 35' taxiways with applicable geometry and clearances

1.4.8 Segmented Circle/Wind Cone

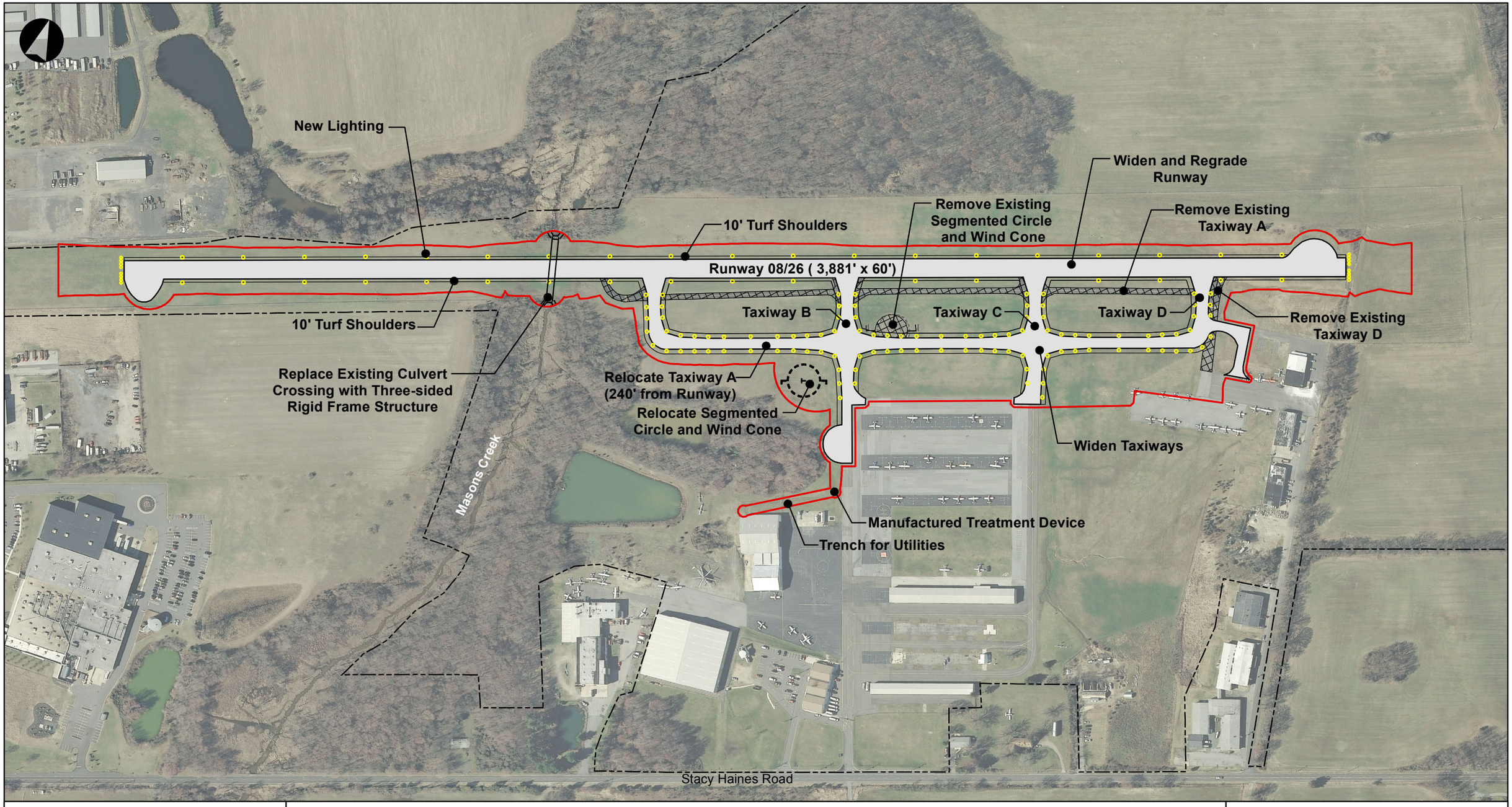
Relocating Taxiway "A" displaces the existing segmented circle/wind cone. The segmented circle is a visual reference on the ground that identifies the airport and the traffic pattern to be used for approach to landing. Located at the center of the segmented circle, the wind cone (wind-sock) is a large, orange conical tube that indicates wind direction and velocity. These markers will be relocated and must be sited according to FAA guidelines and standards.

2.0 Project Description, Purpose and Need

2.1 Description of the Proposed Action

As shown in Figure 2.1-1, the NJDOT proposes to widen Runway 08-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). The major elements of the project area:

- Widen Runway 08-26 from 50' to 60'
- Regrade Runway 08-26 and the surrounding Runway Safety Area (RSA)
- Provide 10' turf shoulders along the runway
- Provide 15' turf shoulders along the taxiway
- Clear the surrounding runway Object Free Area (OFA) including tree removal to the degree practicable
- Widen parallel taxiway "A" from approximately 20' to 35'
- Relocate taxiway "A" centerline 240' off the runway centerline and extend the connecting taxiways
- Relocate the segmented circle and wind cone



300 150 0 300
Feet

Legend

- Project Area
- Airport Property

Proposed Improvements

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 2.1-1

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing (five, 48" CMPs) culvert crossing of Masons Creek with a three-sided rigid frame structure
- Runway/taxiway lighting and markings
- Trenching for buried utilities

The proposed project would not increase the capacity of the airport or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways. The project would not lengthen the existing runway or otherwise have the effect of increasing the number or type of aircraft operations. There are no proposed changes to the FAA's airspace procedures or navigational aids.

2.2 Statement of Purpose and Need

The purpose of the project is to maintain safe and efficient airport operations. The project is needed to correct non-standard conditions associated with the existing runway and taxiway system.

3.0 Alternatives

This section evaluates the Proposed Action and No Action Alternatives in comparative form, in terms of their ability to accomplish the project purpose and need, and in terms of the environmental consequences associated with each alternative.

3.1 The Proposed Action

Under the Proposed Action, the NJDOT would implement the project as described in Section 2.1 and depicted in Figure 2.1-1. If the Proposed Action is implemented, corrective actions would be taken to modify Runway 08-26 and relocate Taxiway "A" in accordance with FAA policies, standards, and specifications for airport planning and design. The proposed project would also be designed and built in accordance with federal, state and local laws and regulations for protection of the environment, including environmental commitments and mitigation measures as needed to obtain and comply with all applicable permits for construction and operation of the project. Given the impact avoidance and minimization measures that have been incorporated into the design, no significant impact on the environment is anticipated.

The Proposed Action enhances safety by bringing the runway and taxiway system up to FAA standards. By doing so, the Proposed Action enhances efficiency by eliminating the operational restrictions and/or location specific encumbrances that currently affect taxiway operations.

The Proposed Action satisfies the project Purpose and Need.

3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be implemented, no construction activities would be permitted to occur, and the existing runway and parallel taxiway system would remain unchanged for the foreseeable future.

The No-Action Alternative limits the NJDOT's ability to bring the existing runway and taxiway system up to FAA standards. Without a construction solution, the design deficiencies discussed in Section 1.4 of this EA cannot be resolved. Consequently, safety and efficiency would not be enhanced and the airport would continue to operate status quo.

The No-Action Alternative fails to satisfy the project Purpose and Need.

3.3 Other Alternatives Considered and Dismissed

There are few if any viable alternatives to achieve the project purpose and need. Two "off-airport" alternatives were considered that involve closing VAY and relocating the based aircraft and associated operations to a different location. "On-airport" alternatives were studied extensively in the Airport Master Plan. No operational alternatives have been identified.

3.3.1 Build a New Airport to FAA Standards

Under this alternative, an airport site selection study would be undertaken to close VAY and relocate to a new location that would allow the runway/taxiway system to be designed and built to FAA standards and with a reasonable allowance for future growth.

New airport development would have costs and environmental impacts of the highest order. Constructing a new airport to replace VAY would involve hundreds of acres of land acquisition, rezoning for runway protection and noise control, business and/or residence relocation, alterations to existing roadways and other modes of surface transportation, in addition to causing development impacts on whatever natural resources might be present at the alternate site.

This alternative is not recommended for further evaluation because the costs and environmental impacts associated with building a new airport would be far greater than those of the proposed project.

3.3.2 Relocate to an Existing Nearby Airport

Under this alternative, an airport site selection study would be undertaken to relocate airport operations to a nearby airport and VAY would be closed. To be considered, the alternate airport must have the facilities required to accommodate the relocation of ±100 based aircraft and operations from VAY or otherwise be capable of expansion to meet those requirements.

The nearest airport in the vicinity of VAY is the Flying "W" Airport (N14), which is located two miles southeast of VAY on Fostertown Road in Lumberton Township. The Flying "W" Airport is a privately-owned, public use, general aviation facility that is very similar to VAY. The 170 acre airport does not have facilities available to accept a sudden and substantial influx of based aircraft or operations. Therefore, N14 would have to be expanded, new airside and landside facilities would have to be developed, and the airport's activity would increase dramatically.

This alternative is not recommended for further evaluation because the costs and environmental impacts associated with relocating to N14 would be far greater than those of the proposed project. No other airports within 20 miles of VAY were identified as potential candidates for relocation.

3.3.3 Relocate the Existing Runway

Under this alternative, the existing runway and parallel taxiway would be moved as needed to avoid, reduce, or minimize potential environmental impacts associated with the proposed project. The Airport Master Plan report included a rigorous evaluation of runway relocation alternatives including 14 scenarios to meet FAA standards for the current and future design aircraft. Those scenarios ranged from shifting the runway east or west, to relocating the runway north or south, to realigning the runway in a different orientation.

Alternatives that involve relocating the runway to a different location (either moving the runway north or south, or changing the orientation) were dismissed due to excessive costs and environmental impacts. Alternatives that involve shifting the runway east or west were also dismissed for being too expensive and impactful. The Airport Master Plan concluded that the most cost effective solution that would cause the least environmental harm is to bring the existing runway/taxiway system up to current FAA standards as soon as possible (Phase I—0 to 5 Years) and in keeping with the long-range plan to extend the runway sometime in the future (Phase III—11 to 20 years).

The proposed runway/taxiway improvements are needed immediately. There is no proposal to extend the runway or parallel taxiway at this time or in the foreseeable future. If and when the need arises and there is such a proposal, those projects would require their own NEPA analysis and FAA determination.

4.0 Affected Environment, Environmental Consequences and Mitigation

4.1 Air Quality

This section discusses the affected air quality environment by first providing a definition of air quality and an overview of federal and local regulations, ambient air quality conditions representative to the areas around VAY, and potential air quality impacts from the Proposed Action. The air quality assessment for the proposed project was conducted in accordance with FAA Order 1050.1F. The analysis includes baseline local air quality conditions and assessment of nonattainment or maintenance pollutants as part of the general conformity applicability analysis, which includes a net emissions analysis for the Proposed Action.

4.1.1 Regulatory Overview and Pollutants of Concern

4.1.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The United States Environmental Protection Agency (USEPA), under the requirements of the 1970 Clean Air Act (CAA), as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR 50). These are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). Criteria pollutants typically result from a wide range of man-made activities and associated stationary and mobile combustion sources. Areas that meet the NAAQS standard for a criteria pollutant are designated as being "in attainment." Areas where a criteria pollutant level exceeds the NAAQS are designated as being "in non-attainment." O_3 non-attainment areas are categorized based on the severity of their pollution problem -- marginal, moderate, serious, severe, or extreme. CO and PM_{10} non-attainment areas are categorized as moderate or serious. When a non-attainment area is re-designated as an attainment area, the CAA requires that a maintenance plan be put in place to ensure continued compliance with the corresponding NAAQS. Therefore, a former non-attainment area is also defined as a maintenance area. Where insufficient data exist to determine an area's attainment status, an area is designated unclassifiable (or in attainment).

4.1.1.2 Nonattainment Pollutant Clean Air Act General Conformity Rule Applicability

The Proposed Action would take place in Burlington County, New Jersey, an area designated as:

- A marginal nonattainment area for O_3
- A maintenance area for $PM_{2.5}$ and CO, and
- An attainment area for all other criteria pollutants

The CAA, as amended in 1990, mandates that states with criteria pollutant nonattainment areas adopt State Implementation Plans (SIPs) that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS. The 1990 CAA Amendments (CAAA) expanded the scope of the statute's "conformity" provisions by clearly relating the concept of proposed federal actions. The CAAA requires that proposed federal actions will be in conformity with the SIP's purpose and may not:

(1) Cause or contribute to any new violations of any standards in any area;

(2) Increase the frequency or severity of any existing violation of any standards in any area; or

(3) Delay timely attainment of any standard or any required interim emission reductions or other milestones in an area.

USEPA has developed two sets of conformity regulations; federal actions are differentiated into transportation projects and non-transportation-related projects:

- Transportation projects funded or requiring approval from Federal Highway Administration (FHWA) or Federal Transit Administration (FTA), which are regulated under the "transportation conformity" regulations (40 CFR Parts 51 and 93), effective on December 27, 1993 and revised on August 15, 1997.
- Non-transportation projects including airport development projects, which are regulated under the "general conformity" regulations (40 CFR Parts 6, 51 and 93) described in the final rule for Determining Conformity of General Federal Actions to State or Federal Implementation Plans published in the Federal Register on November 30, 1993. The general conformity rule (GCR) became effective January 31, 1994 and was revised on March 24, 2010.

Since the Proposed Action is an airport improvement project requiring an approval from FAA, the general conformity rule applies.

4.1.1.3 Air Toxics

USEPA also regulates air toxics that include pollutants known or suspected to cause cancer and/or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes, auxiliary power units (APU), ground support equipment (GSE), etc.), and stationary sources (e.g., power plants). Their effects and potential toxicity may have impacts on human health, including risks of cancer, respiratory conditions, etc. The CAA identifies 187 hazardous air pollutants (HAPs); the USEPA has identified 93 HAPs as mobile source air toxics (MSATs), of which nine are priority MSATs and they are acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust

organic gases (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM). However, it should be noted that unlike the criteria pollutants, no ambient standards have been established for air toxics.

4.1.2 Existing Conditions

Existing air quality conditions in the project area can be reflected through the current status of NAAQS attainment and the recent ambient air monitoring data collected by the New Jersey Department of Environmental Protection (NJDEP) and published by USEPA. VAY is located within Burlington County, New Jersey, and falls within the Metropolitan Philadelphia Interstate Air Quality Control Region (AQCR) (40 CFR Part 81.15). Air quality condition in Burlington County is generally considered good since the ACQR where it falls into has been designated as in "attainment" with the NAAQS for all criteria pollutants with an exception of O_3.

4.1.3 Proposed Action

Aircraft operations and/or vehicle traffic volumes are not expected to change as the result of the Proposed Action. Therefore no long-term changes to air quality are associated with the Proposed Action. There are no changes to long-term operational emissions of both criteria and MSAT pollutants associated with the operation of the Airport under the Proposed Action. Therefore potential increased direct and indirect emissions would only be related to temporary construction activities.

The general conformity requirements (GCR) applies to federal actions occurring in air basins designated as nonattainment for the NAAQS or in attainment areas subject to maintenance plans (maintenance areas). Federal actions occurring in air basins that are in attainment with the NAAQS are not subject to the conformity rule. Since the Proposed Action would occur in a nonattainment area for O_3 and a maintenance area for $PM_{2.5}$ and CO, the GCR applies to the Proposed Action for these nonattainment or maintenance pollutants.

To focus GCR on those federal actions with the potential to have significant air quality impacts, threshold (de minimis) rates of emissions were established in the final rule. A formal conformity determination is required when the annual net total of direct and indirect emissions from a federal action occurring in a nonattainment or maintenance area for a criteria pollutant would equal or exceed the annual de minimis level for that pollutant.

For O_3 nonattainment areas, USEPA's conformity rules establish de minimis emission levels for both O_3 precursors, Volatile Organic Compound (VOC) and nitrogen oxides (NO_x), on the presumption that VOC and NO_x reductions will contribute to reductions in O_3 formation. For the same reason, SO_2 is considered a precursor for $PM_{2.5}$. The applicable de minimis levels applicable for the Proposed Action construction activities include:

- 100 tons per year (tpy) of NO_x and 50 tpy of VOC, since the project site is located in an O_3 moderate nonattainment area in an O_3 transport region.
- 100 tpy for CO, $PM_{2.5}$ and SO_2.

Pursuant to the GCR, all reasonably foreseeable net increase in emissions (both direct and indirect) associated with the implementation of the Proposed Action should be quantified and compared to the applicable annual de minimis levels to determine potential air quality impacts and whether a formal conformity determination is required.

Potential direct and indirect NO_x, VOC, $PM_{2.5}$, CO, and SO_2 emissions from the Proposed Action would be limited to short-term construction emissions resulting from:

- Use of diesel and gas-powered demolition and construction equipment.
- Movement of trucks transporting construction materials and concrete.
- Construction workers commutes.

According to the GCR, a Proposed Action would not require a formal conformity determination and would have minimal air quality impacts if the predicted net increases in annual nonattainment and/or maintenance pollutants are below the corresponding de minimis level.

To address the gap in modeling capability and guidance regarding airport construction emissions, Transportation Research Board (TRB), under the Airport Cooperative Research Program (ACRP), initiated ACRP Project 02-33. The purpose of the project is to develop guidance and a supporting software tool to allow users to better understand and quantify airport construction emissions, and also to bring consistency to airport construction emissions inventories. The analysis was conducted using the Airport Construction Emissions Inventory Tool (ACEIT) developed by TRB. ACEIT facilitates modeling of airport construction emission scenarios based on the project's construction plan. The assessment was performed using input data that reflects the project type, size, location, and timing. The data used represents construction activities associated with the various sub-projects (widening runway, regrading runway and surrounding RSA, clearing surrounding OFA including tree removal, relocating parallel taxiway and extending connecting taxiways, and installing new runway and taxiway lighting, etc.). The ACEIT-predicted total construction activity emissions are summarized in Table 4.1-1

Table 4.1-1: Total Construction Emissions

	Pollutants (tons)				
	VOC	NO_x	$PM_{2.5}$	CO	SO_2
Total Emissions	9.2	5.6	0.3	5.9	0.0
GCR de minimis Threshold	50	100	100	100	100

The assessment demonstrates that project-related construction emissions, conservatively assuming that they would occur within 2019, would be well below applicable de minimis thresholds. Therefore, it can be concluded that no significant air quality impacts would result from proposed construction activities, and overall air quality impacts would not be significant under the Proposed Action.

4.1.4 No Action

The No Action alternative will have no impacts on air quality resources.

4.1.5 Impact Avoidance, Minimization and Mitigation

No mitigation measures would be required for the Proposed Action under the GCR, or under FAA guidance regarding airport construction emissions.

As detailed in Section 6.0, the NJDEP's Office of Permit Coordination and Environmental Review issued a comment letter which addressed various items, including mobile source emissions. In order to minimize potential impacts to air quality, NJDOT will abide by applicable NJDEP recommendations regarding mobile source emissions during the construction period.

4.1.6 References

AECOM Transportation. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

Transportation Research Board. 2014. Guidance for Estimating Airport Construction Emissions.

4.2 Biological Resources

This section describes wildlife and habitat resources in the study area; including terrestrial vegetation and wildlife, aquatic biota/habitat, and threatened, endangered and special status species. The study area for this section generally includes the area to be disturbed by the project, as well as areas extending approximately 300-500 feet along Masons Creek and its associated floodplain.

4.2.1 Existing Conditions

4.2.1.1 Terrestrial Vegetation and Wildlife

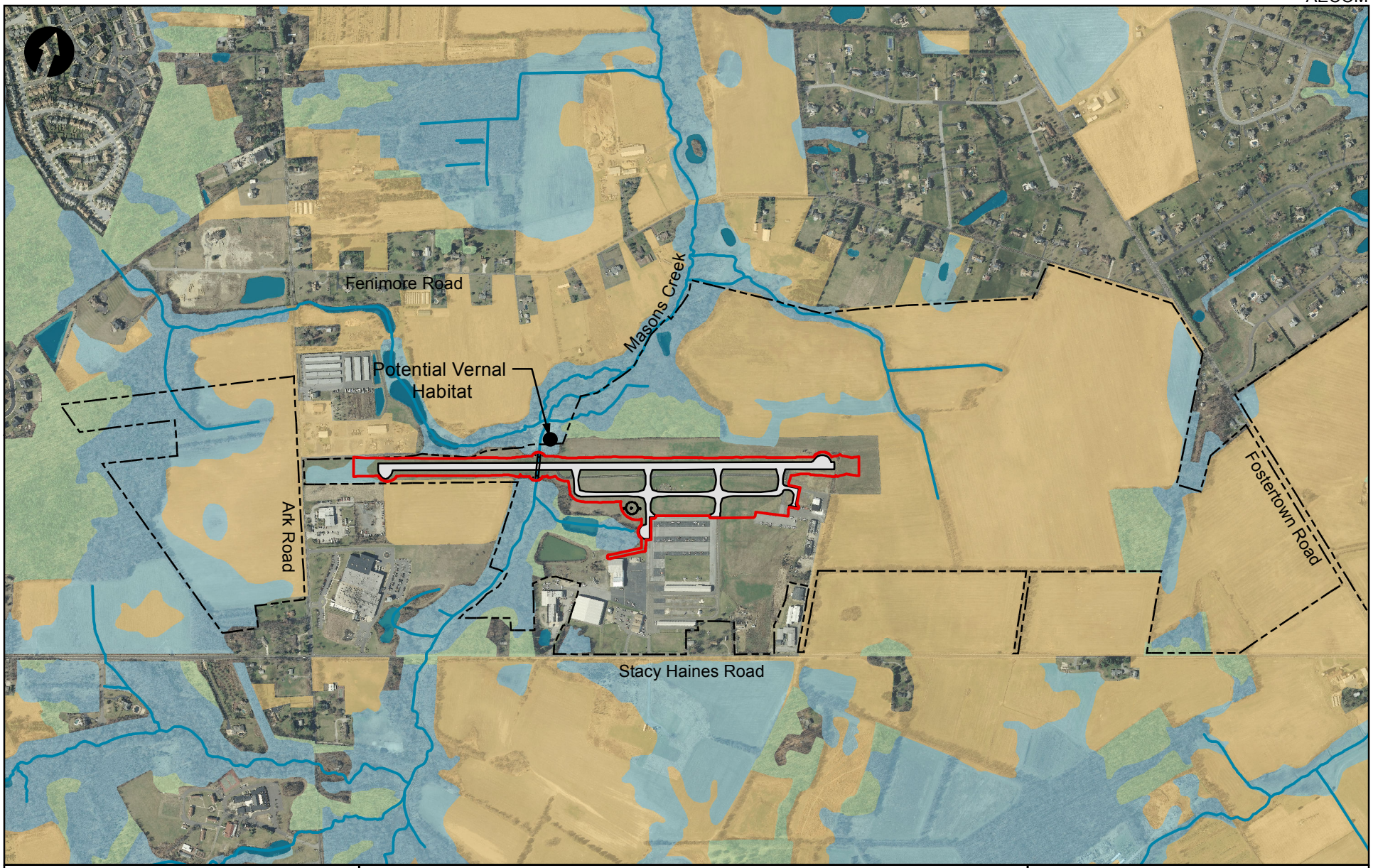
The study area includes predominantly maintained lawn areas along the existing runway and taxiway, and along the proposed relocated taxiway. Wetlands associated with Masons Creek, its unnamed tributaries, and associated ponds exist within the study area. Small areas of adjacent forested uplands also occur around the pond and along the upper edges of the Masons Creek floodplain (Figure 4.2-1).

The maintained lawn areas are dominated by tall fescue (Festuca arundinacea), ryegrass (Lolium spp.), and Kentucky bluegrass (Poa pratensis), with various weed species including common dandelion (Taraxacum officinale), common plantain (Plantago major), English plantain (Plantago lanceolate), wild onion (Allium canadense), common clover (Trifolium repens), chickweed (Stellaria media) and others.

Wetland areas include modified agricultural wetlands as well as emergent, scrub shrub and forested wetlands along Masons Creek and associated waters. Dominant vegetation within these wetlands is described in Section 4.14.1.3.

Upland forested areas consist of relatively mature, secondary growth oak-pine forest comprising mixed oak species, including white (Quercus alba), black (Q. velutina), red (Q. rubra) and Spanish (Q. falcata) oaks, red maple (Acer rubrum), sweet gum (Liquidambar styraciflua) and hickories, including shagbark (Carya ovata), pignut (C. glabra) and mockernut (C. tomentosa). The understory of the forest mainly consists of sassafras (Sassafras albidum), spice bush (Lindera benzoin), and sweet pepperbush (Clethra alnifolia). Common vine species include poison ivy (Toxicodendron radicans), common greenbrier (Smilax rotundifolia), and Japanese honeysuckle (Lonicera japonica).

The greater airport study area offers a mosaic of upland and floodplain forested areas, open grasslands, agricultural fields, emergent and modified agricultural wetlands, some limited scrub-shrub communities and extensive edge habitat. In addition, the larger study area offers standing dead timber (within forested portions), water sources, and connectivity through riparian forests. For these reasons, the site offers a relatively high quality wildlife habitat, although it would be more favored by species adaptable to grassland habitat. As discussed in Section 4.14, a small ponded area on the north side of the runway is considered potential vernal habitat. Vernal pools provide important breeding habitat for various reptile and amphibian species, and are priority areas for protection.



General Habitat Types

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and Field Investigations

Figure 4.2-1

Commonly occurring wildlife species are expected to inhabit both upland and wetland habitats on the site. Mammals include white-tailed deer (Odocoileus virginiana), gray squirrel (Sciurus carolinensis), raccoon (Procyon lotor), white-footed mouse (Peromyscus leucopus), woodchuck (Marmota monax), opossum (Didelphis virginiana), little brown bat (Myotis lucifugus), meadow vole (Microtus pennsylvanicus), red fox (Vulpes fulva), striped skunk (Mephitis mephitis), beaver (Castor canadensis) and others. Bird species include American robin (Turdus migratorius), American crow (Corvus brachyrhynchos), European starling (Sturnus vulgaris), northern cardinal (*Cardinalis cardinalis*), blue jay (Cyanocitta cristata), mourning dove (Zenaida macroura), gray catbird (Dumetella carolinensis), and others. Reptiles and amphibians may include garter snake (Thamnophis sirtalis), black rat snake (Elaphe obsoleta), snapping turtle (Chelydra serpentina), painted turtle (Chrysemys picta), common musk turtle (Sternotherus odoratus), red-backed salamander (Plethodon cinereu), bull frog (Lithobates catesbeianus), green frog (Lithobates clamitan) and others.

During the site inspection of March 2017, evidence of a beaver colony was observed along Masons Creek, upstream of the runway, including damage to several trees, partial blockage of one of the culverts carrying Masons Creek beneath the runway, and a possible beaver lodge. This beaver activity appears to have contributed to the ponded nature of Masons Creek upstream of the runway.

4.2.1.2 Aquatic Biota and Fishery Resources

The NJDEP monitors streams throughout the state for fish and macroinvertebrate community health and physical habitat via the Ambient Biomonitoring Network (AMNET). AMNET sites are tested based on the diversity of the aquatic communities at the site location; specifically the communities of benthic (bottom-dwelling) macroinvertebrates. Three indices are used for the AMNET assessments to account for the State's geographically diverse regions and utilizing genus level taxonomic identification for calculating scores. The index applicable to the project area is the Pinelands Macroinvertebrate Index (PMI). AMNET data is used along with other sources in evaluating the aquatic life designated uses, and has four assessment result categories which include poor, fair, good and excellent, which are based on macroinvertebrate community balance, taxa richness, and the presence/abundance of tolerant versus intolerant species, all of which are indicators of water quality. Physical habitat is also qualitatively assessed as poor, marginal, suboptimal, and optimal based mainly on channel and bank conditions as well as the width and vegetation conditions of riparian corridors.

According to the latest AMNET Benthic Macroinvertebrate Data (Round 3, 2006-2007), monitoring site #AN0172 is located on an unnamed tributary to Masons Creek, located northwest of the airport at Ark Road near Fennimore Road. This tributary flows easterly and skirts the airport property, immediately adjacent to the project area. Assessment results indicated that the PMI for this tributary is poor and the habitat analysis was found to be marginal.

Field studies reveal that Masons Creek has generally poor stream corridor conditions, including obstructed flow (upstream of the runway), channel incision and widening (downstream of the runway), sediment deposition, poor bank stability, and other evidence of high-velocity peak flow discharges during rain events. These conditions are typical of agricultural and urbanized watersheds and are generally associated with low macroinvertebrate and fish species diversity and the presence of more tolerant species.

Masons Creek is expected to provide habitat for various warmwater fishes, including largemouth bass (Micropterus salmoides), pickerel (Esox spp.), sunfish (Centrarchidae spp.), creek chubb (Semotilus atromaculatus) and other species. The upstream section of Masons Creek provides better fish habitat than areas downstream of the runway as the downstream section immediately adjacent to the runway is deeply incised and contains relatively little water. Approximately two miles downstream of the airport, Masons Creek becomes tidal. Based on a review of various mapping sources, it appears that the culverts which carry Masons

Creek beneath the runway are the first upstream impediment to fish passage; therefore, the downstream segments of Masons Creek (i.e., immediately below the runway) may be considered an anadromous clupeid spawning run, potentially supporting spawning migrations of American shad (Alosa sapidissima), river herring, including alewife (Alosa pseudoharengus), blueback herring (Alosa aestivalis), and possibly other anadromous and catadromous species.

4.2.1.3 Threatened, Endangered, and Special Status Species

The NJDEP's Natural Heritage Program (NHP) was consulted for information on the presence of threatened/endangered species within or in the vicinity of the study area. The NHP provided a response letter for the site on March 30, 2017. A review of the New Jersey Landscape Project habitat mapping (Version 3.3) was also conducted as was a review of the NJDEP's Natural Heritage Grid Map. In addition, following United States Fish and Wildlife Service (USFWS) New Jersey Field Office consultation procedures, a species list was obtained from the Information, Planning, and Conservation (IPaC) system. Copies of the NHP response and IPaC species list have been included in Appendix A. The NHP Grid map did not identify any historic or recently documented occurrences of rare plant species or ecological communities; however, the Landscape Project Version 3.3 data, NJDEP-NHP and USFWS identified the following threatened, endangered and special concern species within the project area:

NJDEP-NHP and the Landscape Project Version 3.3 identified species and status within the project area:

- Upland sandpiper (Bartramia longicuada), (State Endangered)
- Great blue heron (Ardea Herodias), (State Special Concern)

NJDEP-NHP and the Landscape Project Version 3.3 identified species and status within one mile of the project site:

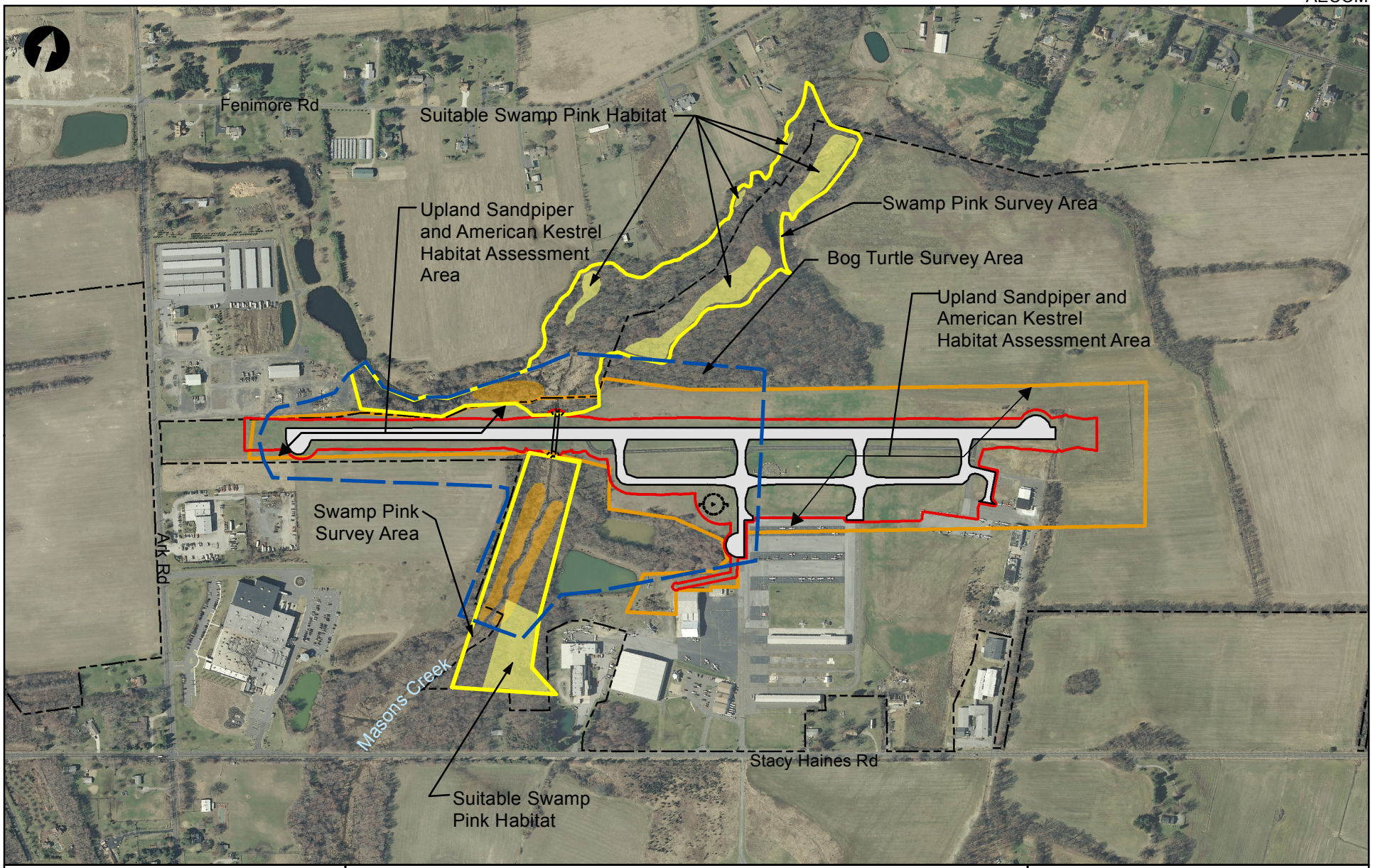
- American kestrel (Falco sparverius) (State Threatened)
- Upland sandpiper (Bartramia longicuada), (State Endangered)
- Great blue heron (Ardea Herodias), (State Special Concern)

USFWS identified potential species and status within the Project Action Area:

- Swamp pink (Helonias bullata) (Federally Threatened, State Endangered)
- Bog turtle (Clemmys muhlenbergii) (Federally Threatened, State Endangered)
- Northern long-eared bat (Myotis septerttrionalis) (Federally Threatened)

Survey and Habitat Assessment

NJDOT performed Phase 1 and Phase 2 bog turtle surveys in addition to surveys to identify suitable habitat, as well as individual swamp pink plants. The project area was also evaluated to determine suitability for upland sandpiper and American kestrel. The survey and habitat assessment work was conducted in the spring of 2017 and winter and spring of 2018 and included the anticipated project disturbance area as well as areas generally within 300 feet, but extending to approximately one-half mile downstream for swamp pink. The results of the field studies are summarized below and (for swamp pink and bog turtle) are documented in Swamp Pink Survey Report, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements (AECOM, 2017), Supplemental Swamp Pink Survey, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements (AECOM, 2017), Phase 1 Bog Turtle Survey Report, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements (AECOM, 2017) and in Phase 2 Bog Turtle Survey Report, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements (AECOM 2018) (See Appendix B and Figure 4.2-2).



Habitat Survey Locations

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 08-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and Field Investigations March and April 2017 and January 2018

Figure 4.2-2

Swamp pink – Swamp pink is a shade tolerant perennial plant that occurs in forested freshwater wetlands. Typically found in headwater wetlands that experience perennial groundwater discharge with deep organic soils, the swamp pink can be identified by its bright pink flower cluster that blooms in early spring, or (in winter) by its smooth, evergreen, lance-shaped leaves which may be partially brownish-red in color and lie almost flat on the ground in a basal rosette. Swamp pink habitat is further characterized as forested headwater wetlands bordering meandering streams. Sphagnum covered hummocks formed by tree and shrub roots provide good habitat for the species, as do small areas of standing water within bogs. Canopy structure plays an important role in swamp pink habitat. The canopy should provide ample shade for the species, and restrict the growth of competitive successional species. More significant to the plant's habitat requirements is the hydrologic conditions. The water table must occur at or near the surface, with minimal seasonal fluctuations or floodwater inundation. The species is highly susceptible to changes in hydrology and often declines as a result.

During the surveys, suitable swamp pink habitat was identified in areas between 700 feet and 1,200 feet upstream of the runway, along a series of small rivulets that discharge into Masons Creek as well as in portions of the outer floodplain areas downstream. In addition to suitable hydrologic conditions and microtopography, several associate species were observed in these areas, including red maple, black gum (Nyssa sylvatica), sweet pepperbush, skunk cabbage (Symplocarpus foetidus) and sphagnum moss (Sphagnum spp.).

In March and April of 2017 approximately ten hours were spent surveying for swamp pink plants, with a focus on areas presenting the most suitable habitat. Following review of the initial survey report, the USFWS recommended additional survey downstream of the runway. The supplemental swamp pink survey was completed in January of 2018 and included an area approximately one-half mile downstream.

The survey work was characterized by close visual inspection of the ground surface in all areas of suitable habitat. Particular attention was given to hummocky areas in seeps and adjacent to small streamlets on the site. Generally, areas exhibiting obvious field indicators of channel incision, sedimentation, inundation and canopy disturbance were surveyed more quickly; and more stable areas of the stream corridor were studied with greater intensity. Swamp pink was not found during the surveys and, based on the observed hydrologic conditions, is not believed to occur within the project action area.

Bog turtle – This species prefers open canopy or early successional wetlands with shallow, spring-fed hydrology and persistent saturated, deep, soft muck soils. Similar to swamp pink, the bog turtle requires a relatively stable hydrologic regime; however, the USFWS notes beaver activity as being possibly instrumental in maintaining the open-canopy wetlands essential for the species.

According to a 1997 Airport Master Plan, there was a historical sighting of this species on the airport circa 1930. The Phase 1 survey of the project area was conducted in March of 2017. Wetlands associated with Masons Creek include predominantly emergent and forested types with in-between areas containing small scrub-shrub communities. The area contains substantial microtopography, and several groundwater seeps were observed with mucky substrate encountered to 20 inches in depth. Associate species identified on the site include sedges, skunk cabbage, reed canary grass (Phalaris arundinacea), silky dogwood (Cornus amomum), red maple, and speckled alder (Alnus incana). The Phase 1 survey revealed that the wetlands along the Masons Creek corridor consist of emergent, riparian and wet meadow features, with enough areas of spring fed hydrology and mucky soil to warrant characterization as potential bog turtle habitat.

With the identification of potential habitat, a Phase 2 survey was conducted in April, May and June of 2018. The Phase 2 survey followed the USFWS-recommended four to six person-hours of survey per acre of designated survey area per visit to ensure sufficient effort to locate bog turtles. Survey techniques included

searching visually for exposed individuals by hand and with sticks, in mud, tunnels, subterranean rivulets, springs, under vegetation, in pockets of standing water, and in other microhabitats likely to support the species. The Phase 2 survey concluded the probable absence of bog turtles within the designated survey areas.

Upland sandpiper – The upland sandpiper is "a bird of the open countryside". The upland sandpiper spends little time near water, and is found inhabiting grasslands, fallow fields and meadows that are typically associated with pastures, farms and airports. These birds are typically found nesting in upland meadows and short-grassed grasslands, in which the vegetation is generally 3 to 16 inches in height. A mix of tall and short grasses and forbs provide foraging and nesting habitat for the upland sandpipers. Strips of short grasses located along runways and taxiways as well as adjacent areas of taller grasses are typically used by these birds. Common species found in these grasslands include: timothy (Phleum spp.), bluegrass (Poa spp.), needlegrass (Stipa spp.), bluestem (Andropogon spp.), quackgrass (Argopyron spp.), Junegrass (Koeleria spp.), and bromegrass (Bromus spp.). Occasional structures such as fences, scattered trees or telephone poles near the grasslands provide perching habitat for this species.

The airport property is composed of maintained open fields and agricultural lands which are both indicated by the NJDEP as breeding habitat for the upland sandpiper. The Landscape Project data shows breeding sightings (circa 1983) on the airport property and within the project area. Based on various site visits in 2016 and 2017 as well as the Threatened and Endangered Species Habitat Assessment for Runway 08/26 Obstruction Removal, South Jersey Regional Airport (VAY) (Amy S. Greene Environmental Consultants, Inc. 2015), it is clear that the semi-maintained fields within and around the project area meet the habitat requirements for the species. These fields contain various grassland species approximately 2 to 8 inches in height, and appear to be mowed at some unknown frequency. For the purposes of this assessment, the presence of upland sandpipers within the project area will be presumed, and precautions will be taken to avoid any adverse impact to the species, as further discussed below.

American kestrel – According to NJDEP, American kestrels inhabit large open areas with short vegetation and are commonly attracted to farmland, parks and pastures. Although they prefer open areas, kestrels also utilize forestlands, and nest in tree cavities that are either naturally occurring or hollowed out by other birds such as woodpeckers. American kestrels feed on mice, voles, insects and reptiles as well as smaller birds. They often perch on utility lines or branches from which they hunt, but also hover in the wind and capture smaller birds in flight. Conversion of agricultural lands to development or forestland is considered to be a loss of habitat and; in the case of unused farmland converting to forestland, may result in increased predation by larger raptors.

Although the NJDEP Landscape Project habitat mapping depicts the kestrel habitat not on the airport, but to the south of the airport, in the open fields opposite Stacy Haines Road, the airport property contains maintained open fields and agricultural lands with interspersed woodlands which appear to be favorable to the American kestrel. For the purposes of this assessment, the presence of the American kestrels within the project area will be presumed. Potential impacts to this species are further discussed below.

Northern Long-Eared Bat and the 4(d) Rule

Found throughout the State of New Jersey, northern long-eared bats hibernate in caves and mines over winter and inhabit wooded areas in the summer where they roost underneath bark, in cavities, or in crevices of both live and dead trees. There are no hibernaculum in the project area; however, in southern New Jersey the northern long-eared bat is known to roost in pitch pine forests and Atlantic white cedar swamps. The IPaC species list included northern long-eared bat, and forested portions of the study area provide suitable habitat for northern long-eared bats.

It should be noted that in January of 2016, the USFWS published the final 4(d) rule which identifies Endangered Species Act protections for the northern-long eared bat. With the 4(d) rule, the USFWS has determined that designating critical habitat in the areas where northern long-eared bats summer would not benefit the species because northern long-eared bat summer habitat is not limited or in short supply, and white-nose syndrome, not summer habitat loss, is the greatest threat to the species.

Special Status Species

Species protected under the Fish and Wildlife Coordination Act - Sections of Masons Creek below the runway are expected to provide migration, spawning, and forage habitat for anadromous fishes such as alewife, blueback herring, and American shad. Two of these species, the alewife and blueback herring, were recently considered for listing as either threatened or endangered under the federal Endangered Species Act. The National Oceanic and Atmospheric Administration's (NOAA) Fisheries office determined that listing was not warranted but considers these to be "Species of Concern" and is initiating proactive conservation efforts to protect these species. For all in-water work to be conducted, seasonal restrictions may be imposed between March 1 and June 30 as well as possibly between September 1 and November 30, depending on the work being performed.

Great blue heron - The NJDEP-NHP identified great blue heron (Ardea herodias) foraging habitat in the project area. The great blue heron does not receive any substantive protection under the Endangered Species Act or under State regulations; however, they may be considered for protection or otherwise warrant special attention. Suitable habitat for this species is believed to exist in the project area, as great blue herons forage in lakes, rivers, and other surface waters.

Other species addressed under the Migratory Bird Treaty Act and NJ Endangered and Nongame Species Conservation Act - The IPaC species list identified 27 migratory species of birds of conservation concern which may be potentially affected by activities within the proposed project area. In addition, various nesting birds are protected under the NJ Endangered and Nongame Species Conservation Act, which may also be affected by the project.

4.2.2 Proposed Action

4.2.2.1 Terrestrial Vegetation and Wildlife

Wildlife inhabiting areas adjacent to the project disturbance areas may be temporarily disturbed or displaced due to the proximity of construction activities. However, undisturbed habitat outside the limits of disturbance is expected to be re-inhabited by wildlife following construction. The project is not expected to result in any long-term or permanent loss of plants or wildlife species, nor will the project result in substantial loss, reduction, degradation, disturbance, or fragmentation of native species habitats or populations. Furthermore, the project will not have adverse impacts on any species reproduction rates, mortality rate or ability to sustain population levels.

4.2.2.2 Aquatic Biota and Fishery Resources

The project will involve limited in-water construction associated with replacement of the culvert and removal of near watercourse vegetation; however, with the use of Best management practices (BMPs), no long-term or short-term impacts to aquatic biota and fishery resources are expected.

4.2.2.3 Threatened, Endangered, and Special Status Species

Potential impacts to threatened, endangered and special status species are discussed below along with a discussion of consultation with the New Jersey Division of Fish and Wildlife (NJDFW) and USFWS, and a description of how impacts will be avoided, minimized, or mitigated.

Swamp pink – Based on the results of an initial survey, the USFWS recommended supplemental downstream survey via informal consultation pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) (ESA). Upon review of both survey reports, the USFWS concurred with the finding that the project is not likely to adversely affect this species as it is not believed to exist within the project action area (see Appendix A).

Bog turtle – Upon USFWS review of the Phase 1 survey results, the FAA, NJDOT and USFWS continued coordination in order to ensure the protection of this species. During the consultation, the FAA agreed to perform a Phase 2 bog turtle survey prior to final design of the project in order to determine the presence/likely absence of the species. In turn, the USFWS concurred that the project is not likely to adversely affect bog turtles in the event surveys indicate probable absence of the species. On September 11, 2018, the USFWS memorialized their review of and concurrence with the Phase 2 finding that bog turtles are likely absent within the project action area. Based on this, the Service's original concurrence letter dated February 27, 2018 stands. The USFWS indicated that no further Section 7 consultation is required unless the project scope is expanded during final design or pre-construction (see Appendix A).

Upland sandpiper – This species is presumed to exist within the study area; however, seasonal restrictions on disturbance to grassland habitat are expected to effectively protect the species from impact. Based on coordination with the NJDFW, a timing restriction is required on any impact to taller grassland areas which could be considered nesting habitat between April 1 and August 15.

American kestrel – This species is presumed to exist within the study area; however, the project will not result in any meaningful loss of open field and farmland habitat. A relatively minor amount of existing grassland will be converted due to the widening of runway and taxiway pavements; however, this impact is considered minimal and not detrimental to the species.

Northern long-eared bat – Summer roosting northern long-eared bats are expected to inhabit forested areas within the project area, portions of which will be impacted by the project. Tree clearing will be limited to the fullest extent possible, and the project will comply with the northern long-eared bat 4(d) rule. In accordance with the 4(d) rule, the project area is located in the White-Nose Syndrome Zone; however, the project is excepted from the incidental taking prohibitions in the final 4(d) rule. No prohibited incidental take will occur as there will be no tree removal within 1/4 mile of a known hibernaculum, nor will the proposed tree removal cut or destroy a known occupied maternity roost tree or any other trees within a 150-foot radius of a known maternity roost tree during the pup season (June 1 through July 31).

In accordance with the optional framework to streamline Section 7 consultation for the northern long-eared bat, the FAA as the lead federal agency will rely on the biological opinion that the USFWS prepared for the 4(d) rule, and has notified the USFWS at least 30 days in advance of funding, authorizing, or carrying out the Proposed Action via submission of the Streamlined Consultation Form, which was submitted to the USFWS on December 6, 2017 (see Appendix A).

Great blue heron – Should they exist within the project area, great blue heron may be temporarily disturbed by construction; however, this species is highly mobile and individuals would be able to relocate to suitable habitat in the surrounding vicinity. Adverse impacts to this species are not anticipated.

Other species addressed under the Migratory Bird Treaty Act and NJ Endangered and Nongame Species Conservation Act – The project will not require extensive tree clearing; however, in order to avoid impacts to nesting birds, and as recommended by NJDFW, tree clearing will be seasonally restricted from April 1 to August 31.

4.2.3 No Action

The No Action alternative will have no impacts on biological resources.

4.2.4 Impact Avoidance, Minimization and Mitigation

NJDOT has worked to avoid or minimize long-term impacts to terrestrial vegetation and wildlife, aquatic biota and habitat, and threatened, endangered and special status species in several ways:

- Limit taxiway length to avoid crossing Masons Creek which would require habitat impacts, wetland and riparian zone impacts, as well as permanent in-water structures.
- Minimize disturbance to sensitive resources along Masons Creek by seeking modifications to the design standards in order to avoid clearing trees and shrubs within the entire Runway Object Free Area.
- Minimize the area of construction disturbance to the minimum necessary to effectively meet the Purpose and Need.
- Abide by any NJDEP requirements for mitigation as determined through the Division of Land Use Regulation (DLUR) permit application process.
- Provide water quality and stormwater management enhancements for the project. The proposed stormwater management facilities are expected to include vegetative filtration for storm water sheet flow draining off the runway and taxiways; grass swale treatment where there is 200' of shallow concentrated flow upstream of each inlet; and a manhole-style hydrodynamic separation-type manufactured treatment device. Best management practices (BMPs) and Low Impact Design techniques will be incorporated to the fullest extent practicable and designed in accordance with the NJDEP Stormwater Management Rules (N.J.A.C. 7:8) and the New Jersey Stormwater Best Management Practices Manual.
- Require the Contractor to implement and maintain controls during construction to protect aquatic biota and habitat from sedimentation and exposure to acid-producing soils. Excavations will be monitored for the presence of acid-producing soils during construction. If such soils are encountered, mitigation measures will be implemented in accordance with NJDEP and NJDOT requirements.
- Apply standard soil erosion and sediment control measures including heavy duty silt fence, hay bales, inlet filters and a stabilized construction entrance.
- Require the Contractor to implement and maintain controls during construction to protect waterways from sedimentation and accidental spills of construction materials and debris that could have long-term effect on aquatic biota and habitat.

- Prohibit construction staging activities (including the storage of vehicles, equipment, or materials) in or near environmentally sensitive areas that would not otherwise be impacted by the project.
- Implement a spill prevention and cleanup plan during construction to address potential for discharges of petroleum, grease or other fluids from construction equipment. This plan will require inspections of construction equipment at the start of each work day to check for evidence of leaks; parking equipment away from wetlands, waterways, and storm drains when not in use; conducting equipment fueling operations away from wetlands, waterways, and storm drains; and maintaining a spill kit with an adequate supply of sorbent materials, booms, etc.
- Specify other standard environmental controls, including the use of concrete washout stations to be located away from area waterways and wetlands.
- Abide by NJDFW required timing restrictions from April 1 and August 15 for impacts to taller grassland areas which could be considered nesting habitat.
- Abide by NJDFW recommended timing restrictions from April 1 and August 31 regarding trimming or removal of trees to minimize impacts to nesting birds protected under NJ Endangered and Nongame Species Conservation Act.
- Abide by NJDFW recommendations by restricting trimming or removal of trees between April 1 to August 31.
- Abide by NJDFW-recommended timing restrictions from April 1 to June 30 on any in-water and/or sediment generating activities in order to protect warm-water fish and pickerel.

4.2.5 References

AECOM. 2015. South Jersey Regional Airport Master Plan Update.

AECOM. 2017. Survey and Habitat Assessment Report, NJDOT South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements.

Amy S. Greene Environmental Consultants. 2015. Threatened and Endangered Species Habitat Assessment for Runway 08/26 Obstruction Removal South Jersey Regional Airport (VAY).

Arndt, Rudolf G. 2004. Annotated Checklist and Distribution of New Jersey Freshwater Fishes With Comments on Abundance. Division of Natural Sciences and Mathematics The Richard Stockton College of New Jersey. The Bulletin New Jersey Academy of Science 49(1). Pp 1-33.

Conserve Wildlife Foundation of New Jersey. 2010. New Jersey Endangered and Threatened Species Field Guide: Upland Sandpiper.

<http://www.conservewildlifenj.org/species/fieldguide/view/Bartramia%20longicauda/>

MacNeill Tagg Engineers. 1997. Airport Master Plan, South Jersey Regional Airport, Lumberton Township, Medford, New Jersey.

NJDEP Division of Fish and Wildlife Bureau of Freshwater Fisheries. 2000. Locations of Anadromous American Shad and River Herring During Their Spawning Period in New Jersey's Freshwaters Including Known Migratory Impediments and Fish Ladders. Sicklerville, NJ 08081.

NJ Division of Fish and Wildlife. 2017. New Jersey's Endangered and Threatened Wildlife: American kestrel. <http://www.state.nj.us/dep/fgw/ensp/pdf/end-thrtened/kestrel.pdf>

NJ Division of Fish and Wildlife. 2017. New Jersey's Endangered and Threatened Wildlife: Upland Sandpiper. <http://www.njfishandwildlife.com/ensp/pdf/end-thrtened/uplndsandpiper.pdf>

4.3 Climate

Significant, lasting change to existing weather patterns is commonly called "climate change". The term "greenhouse gases" refers to a variety of gases in the earth's atmosphere that react with sunlight in a way that influence global air temperature. Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect—a natural phenomenon where gases trap heat within the lowest portion of the earth's atmosphere, causing heating at the surface of the earth. The primary long-lived GHGs directly emitted by human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Climate change due to greenhouse gas emissions is a global phenomenon, so the affected environment is the global climate.

In 2012, the FAA issued guidance for assessing greenhouse gases and climate change (Order 1050.1F, Guidance Memo #3: Considering Greenhouse Gases and Climate Change under the National Environmental Policy Act; Interim Guidance to FAA Order 1050.1F [FAA 2012b]). This memo explicitly identifies climate change as a category of potential environmental effect to be considered in NEPA documents, and provides guidance on documenting the extent and context of greenhouse gas emissions for aviation projects. While no significance thresholds have been determined for Climate, FAA Order 1050.1F requires an evaluation of climate impacts from proposed actions.

4.3.1 Existing Conditions

Research has shown a direct correlation between fuel combustion and greenhouse gas emissions. In terms of U.S. contributions, the General Accounting Office reports that domestic aviation contributes about 3% of total carbon dioxide emissions, according to USEPA data compared with other industrial sources, including the remainder of the transportation sector (20%) and power generation (41%). The International Civil Aviation Organization estimates that greenhouse gas emissions from aircraft account for roughly 3% of all anthropogenic greenhouse gas emissions globally.

Airport operations in the form of aircraft takeoffs and landings and associated ground service equipment presently result in fossil fuel combustion and associated GHG emissions. The inefficiencies experienced at the airport due to inadequate separation of the runway and taxiway results in an incremental amount of additional GHC emissions as aircraft sometimes idle for longer periods waiting for other planes to clear the runway.

The airport current level of preparedness in the study area with respect to the impacts of climate change is insufficient. One of the many trends with climate change is an increase in the number and severity of storms causing major flooding issues. A section of the existing runway falls within the 100-year floodplain of Masons Creek. This elevation below the floodplain puts airport operations at risk if Masons Creek were to flood and inundate the runway.

4.3.2 Proposed Action

On a short-term scale, construction activities would result in the burning of fossil fuels by construction equipment as well as an increase in construction-related vehicle traffic over the construction period. Construction-related GHG emissions would not be significant and would cease with the completion of the Proposed Action. Therefore, the change in climate conditions caused by GHGs from the burning of fossil fuels is a global effect and the project-level emissions resulting from the Proposed Action will have no potential to have a significant impact on global or U.S. cumulative GHG emissions and global climate change.

From a long-term, operational perspective, the Proposed Action would not increase the frequency of operations at the airport and therefore would result in increased fossil fuel combustion and associated GHG emissions. A minor, incremental GHC reduction could, however, be realized from the increased efficiency associated with adequate separation of the runway and taxiway.

The Proposed Action would also raise the elevation of the runway around Masons Creek and includes the replacement of the existing (five, 48" CMPs) culvert crossing of Masons Creek with a three-sided rigid frame structure to accommodate peak flows of the NJ Flood Hazard Area design storm flood of Masons Creek beneath the runway. The new structure will reduce the extent to which the runway would become inundated in the event of a large flooding event, helping the airport be better prepared for the impacts of climate change (severe storms and flooding).

4.3.3 No Action

Under the No Action Alternative, there would be no construction activities; therefore, no change in GHG emissions. Under the No Action Alternative, the existing Runway would remain within the floodplain of Masons Creek, resulting in a greater risk of impacts due to climate change.

4.3.4 Impact Avoidance, Minimization and Mitigation

Mitigation measures to reduce construction-related GHG emissions are as follows:

- Use modern, well-maintained machinery and vehicles meeting applicable emission performance standards during construction;
- Use of more efficient road vehicle fleets having a lower unit emission ratio; and
- When feasible, power down idling construction equipment and vehicles.

4.3.5 References

USEPA, U.S. Global Change Research Program, Global Climate Change Impacts in the United States, 2009.

USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007, April 15, 2009.

Intergovernmental Panel on Climate Change. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.

4.4 Coastal Resources

Coastal resources include coastal zones and coastal barriers. Coastal zones are those waters and their bordering areas in states along the coastlines of the Atlantic and Pacific Oceans and the Gulf of Mexico and the shorelines of the Great Lakes. Coastal barriers are landforms such as barrier islands that provide protection for distinct aquatic habitats and serve as the mainland's first line of defense against damage from coastal storms and erosion. The FAA is responsible for determining whether proposed development actions at airports have the potential to affect any coastal use or resource.

4.4.1 Existing Conditions

New Jersey is a coastal state with resources protected under the Coastal Zone Management Act of 1972, as amended (CZMA). Accordingly, the State of New Jersey has a federally-approved program for the effective management, beneficial use, protection and development of its coastal lands and waters. The New Jersey Coastal Management Program is part of the National Coastal Zone Management Program.

According to NJDEP, the coastal zone encompasses tidal and non-tidal waters, waterfronts and inland areas and includes the Hudson River and related tidal waters, south to the Raritan Bay, then along Sandy Hook to Cape May Point encompassing the state territorial waters of the Atlantic Ocean and associated tidal water bodies. From Cape May the coastal zone follows the Delaware Bay and Delaware River and includes tidal portions of their tributaries as well as certain upland areas along these tidal waters.

Lumberton Township is identified as a Coastal Municipality as tidal waters occur within the township. A review of the USFWS Coastal Barrier Resources System Mapper indicates that the airport is not located within a coastal barrier. NJDEP GIS mapping indicates that the site is not located within the coastal area defined in the Coastal Area Facility Review Act (CAFRA), and that the head of tide along Masons Creek is located over two miles downstream of the site; therefore, the airport site is not located within the coastal zone.

4.4.2 Proposed Action

The project site is not located within a coastal zone; therefore, the project will not impact coastal resources.

4.4.3 No Action

The No Action Alternative will not impact any coastal resources.

4.4.4 Impact Avoidance, Minimization and Mitigation

The Proposed Action and No Action Alternative would not impact any coastal resources; therefore, no minimization or mitigation of potential impacts is necessary.

4.4.5 References

National Oceanic and Atmospheric Administration (NOAA). 1972. Coastal Zone Management Act 16 U.S.C.§§ 1451-1466.

NJDEP: Land Use Management. 2017. New Jersey Coastal Management Program. <http://www.state.nj.us/dep/cmp/index.html#njcmp>

U.S. Department of the Interior. 1992. Coastal Barrier Resources Act 16 U.S.C. § 3501 et seq.

U.S. Fish and Wildlife Service Coastal Barrier Resources System Mapper. October 2017. <https://www.fws.gov/CBRA/Maps/Mapper.html>

4.5 Department of Transportation Act, Section 4(f)

The U.S. Department of Transportation Act of 1966 (DOT Act) included a special provision, Section 4(f), which regulates the use of land from publically-owned parks, recreation areas, wildlife and waterfowl refuge areas, or public and private historical sites by USDOT agencies. Section 4(f) also applies to archeological sites, but only where preservation in place is warranted. Section 4(f) applies to all agencies within the USDOT, including FAA.

4.5.1 Existing Conditions

The project area and surrounding vicinity were evaluated to identify any Section 4(f) resources. No public parks, recreational lands, or wildlife or waterfowl refuges have been identified within the project area. The only parkland Section 4(f) resource in the vicinity of the project area is the Medford Wildlife Management Area, located south of VAY, across Stacy Haines Road. Historic Section 4(f) resources in the project vicinity include the Lumberton Rural Agricultural District, which encompasses eastern portions of the airport property and surrounding areas, as well as a potentially eligible archeological district in the area, comprised of a series of Pre-Contact Native American sites distributed across the landscape (See Section 4.8 for more information).

4.5.2 Proposed Action

The Proposed Action will not use land from any parkland or wildlife/waterfowl refuges. As noted in Section 4.8, the Section 106 consultation resulted in a finding that no historic properties will be affected by the project; therefore, use of historic Section 4(f) resources will not occur. While it is recognized that the archaeology site identified during testing may be associated with a larger site complex that has not been evaluated as a whole for National Register eligibility; avoidance of the defined archaeology site in accordance with agreed protective measures precludes Section 4(f) use, even if the site were presumed eligible.

4.5.3 No Action

The No Action AIternative will have no impacts on Section 4(f) resources.

4.5.4 Impact Avoidance, Minimization and Mitigation

No Section 4(f) resource would be used by the proposed project; therefore, no mitigation is necessary.

4.5.5 References

NJDEP Bureau of GIS. 2017. NJ-GeoWeb.

Delaware Valley Regional Planning Commission and the Open Space and Environmental Preservation Council of Lumberton Township. 2007. Environmental Resource Inventory for the Township of Lumberton Burlington County, New Jersey.

Public Law 89-670-OCT. 15, 1966. U.S. Department of Transportation Act.

Lumberton Township New Jersey. 2017. Parks and Recreation. <http://www.lumbertontwp.com/departments-services/recreation/parks-recreation/>

4.6 Farmlands

While it is recognized that portions of the airport property are preserved as farmlands under Lumberton Township's Transfer of Development Rights (TDR) program (further discussed in Section 4.9.1.3), for the purposes of this analysis, agricultural lands that could be affected by the project were identified and assessed in accordance with the Farmland Protection Policy Act (FPPA) of 1981 (7 U.S.C. 4202 et seq.) and implementing regulations contained in 7 C.F.R., Part 658. The Act requires "federal agencies to examine the effects of their actions using the criteria set forth in the rule and consider alternatives to lessen any adverse effects."

To assess the suitability of the project area for protection as farmland, the Site Assessment Criteria set forth in Section 7 C.F.R. 658.5 (b) was applied. Existing land use was characterized via NJDEP's 2012 Land Use/Land Cover GIS data and supplemented via field investigations.

4.6.1 Existing Conditions

Prime Farmland Soils and Statewide Important Farmland Soils for the Airport Property have been identified and mapped utilizing the United States Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) Soils Survey. No Soils of Local Importance or Unique Soils were reported for Burlington County within the Airport Property. Prime Farmland Soils and Statewide Important Farmland Soils are defined as follows:

Prime Farmlands include all those soils in Land Capability Class I and selected soils from Land Capability Class II. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods. Prime Farmlands are not excessively erodible or saturated with water for long periods of time, and they either do not flood frequently or are protected from flooding.

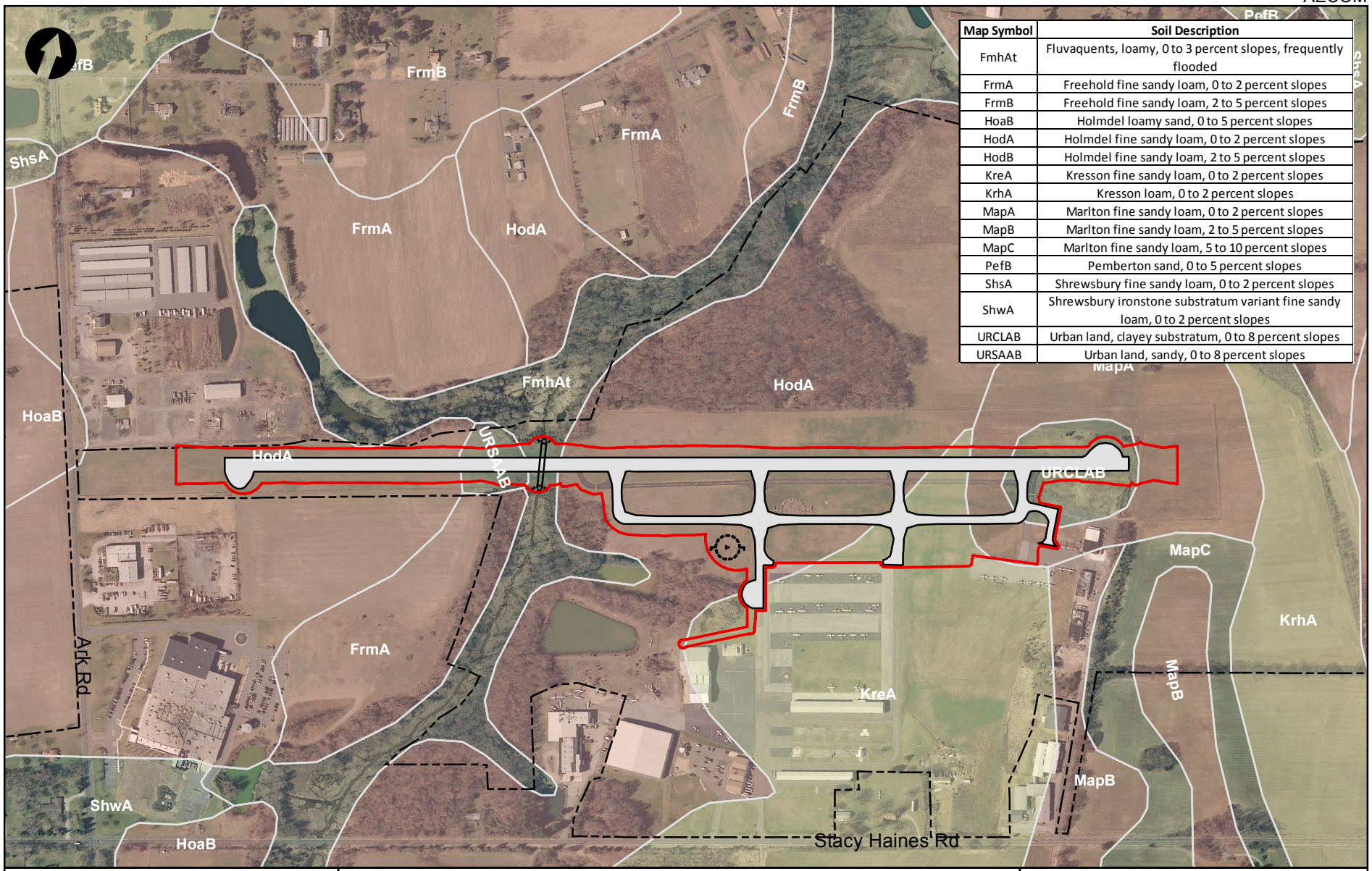
Farmlands of Statewide Importance include soils in Land Capability Class II and III that do not meet the criteria for Prime Farmland. These soils are nearly Prime Farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as Prime Farmland if conditions are favorable.

Table 4.6-1 below lists soils within the Airport Property that are classified as Prime Farmland Soils and Statewide Important Soils. Figure 4.6-1 below shows the location of these soils.

TABLE 4.6-1
Prime and Statewide Important Farmland Soils in the Airport Property

Prime Farmland Soils	Statewide Important Farmland Soils
Freehold fine sandy loam, 2 to 5% slopes (FrmB)	Kresson fine sandy loam, 0 to 2% slopes (KreA)
Holmdel loamy sand, 0 to 5% slopes (HoaB)	Kresson loam, 0 to 2% slopes (KrhA)
Holmdel fine sandy loam, 0 to 2% slopes (HodA)	Pemberton sand, 0 to 5% slopes (PefB)
Marlton fine sandy loam, 0 to 2% slopes (MapA)	Shrewsbury fine sandy loam, 0 to 2% slopes (ShsA)
Marlton fine sandy loam, 2 to 5% slopes (MapB)	

Source: NRCS
Note: Includes drained soils only



Map Symbol	Soil Description
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded
FrmA	Freehold fine sandy loam, 0 to 2 percent slopes
FrmB	Freehold fine sandy loam, 2 to 5 percent slopes
HoaB	Holmdel loamy sand, 0 to 5 percent slopes
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes
HodB	Holmdel fine sandy loam, 2 to 5 percent slopes
KreA	Kresson fine sandy loam, 0 to 2 percent slopes
KrhA	Kresson loam, 0 to 2 percent slopes
MapA	Marlton fine sandy loam, 0 to 2 percent slopes
MapB	Marlton fine sandy loam, 2 to 5 percent slopes
MapC	Marlton fine sandy loam, 5 to 10 percent slopes
PefB	Pemberton sand, 0 to 5 percent slopes
ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes
ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes
URCLAB	Urban land, clayey substratum, 0 to 8 percent slopes
URSAAB	Urban land, sandy, 0 to 8 percent slopes

600 0 600

Feet

Legend

- Airport Property
- Project Area
- Soils of Statewide Importance
- Prime Farmland Soils

Soils Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and USDA NRCS Web Soil Survey

Figure 4.6-1

4.6.2 Proposed Action

The FAA Guidelines for Implementation were utilized to determine the extent of project applicability compliance with FPPA procedures. With regard to Prime Farmland Soil being considered "Farmland" suitable for protection under the Act, there are certain special situations which have a bearing on applicability because of the FPPA definition of "Farmland". Prime Farmland does not include land already in or committed to urban development or water storage. Farmland "committed to urban development or water storage" includes all such land that receives a combined score of 160 points or less from the land evaluation and site assessment criteria.

According to the Guidelines for Use of Criteria (7 CFR 658.4), each Federal agency shall use the criteria provided in Section 658.5 to identify and take into account the adverse effects of Federal programs on the protection of farmland. An agency may determine whether or not a site is farmland, as defined in Section 658.2(a), or the agency may request that the NRCS make such a determination. If an agency elects not to make its own determination, it should make a request to NRCS on Form AD-1006, the Farmland Conversion Impact Rating Form (hereafter referred to as Form AD-1006).

In accordance with the FAA Guidelines for Implementation, Form AD-1006 need not be submitted to the NRCS in cases where the site assessment criteria (Part VI of Form AD-1006) score is less than 60 points. The rationale is based on NRCS regulation (7 C.F.R. 658.4[c][2]) which provides that "Sites receiving a total score of less than 160 points be given minimal level of consideration for protection and no additional sites be evaluated." The maximum score that can be assigned to the land evaluation (Part V of Form AD-1006) is 100 points. Therefore, where the site assessment (Part VI) is less than 60 points, the total score (Parts V and VI) would always be less than 160 points. To document compliance with NRCS regulation, it is only necessary to complete Parts I, III, V (assign 100 points), and VI, place the completed form in the project files, and include evidence in the environmental report that the FPPA Rule has been followed (as summarized below).

The site assessment criteria set forth in 7 C.F.R. 658.5(b) (along with the provisions of Section 658.5[c]) were used to assess the suitability of the project area for protection of farmland. This site assessment consists of a series of 12 criteria. Each criterion is given a scaled score, with the agency conducting the assessment making scoring decisions by examining the site, surrounding area, and the programs and policies of the State or local unit of government in which the site is located. Table 4.6-2 summarizes the completed site assessment criteria, includes the maximum points possible, and presents the total site assessment points calculated in following this process. This information was taken directly from the completed Form AD-1006. This form is not required to be submitted to the NRCS to meet the reporting requirements of the FPPA but has been included in Appendix C of this report for documentation purposes.

It should be noted that the "Site" as defined by 7 CFR 658.2 means the location(s) that would be converted by the Proposed Action; therefore, the site for the purposes of this assessment is the limit of disturbance (LOD) shown as the Project Area on Figure 4.6-1. The LOD is contained within the existing airfield, including the existing runway, its associated taxiways and surrounding lawn areas.

TABLE 4.6-2
Summary of Completed FPPA Site Assessment Criteria

Site Assessment Criteria (These criteria are explained in 7 CFR 658.5[b])	Maximum Points	# Points Calculated
1. Area in Nonurban Use	15	11
2. Perimeter in Nonurban Use	10	0
3. Percent of Site Being Farmed	20	0
4. Protection Provided by State and Local Government	20	0
5. Distance from Urban Builtup Area	15	5
6. Distance to Urban Support Services	15	0
7. Size of Present Farm Unit Compared to Average	10	10
8. Creation of Nonfarmable Farmland	25	0
9. Availability of Farm Support Services	5	0
10. On-Farm Investments	20	0
11. Effects of Conversion on Farm Support Services	25	0
12. Compatibility with Existing Agricultural Use	10	0
TOTAL SITE ASSESSMENT POINTS	160	26

The project does not involve acquisition of farmland, or use of farmland, that would be converted to non-agricultural use and is protected by the FPPA. The completed FPPA site assessment score is less than 60 points; therefore, the site does not qualify for protection under the FPPA. As stated in the FAA Guidelines for Implementation, to document compliance with the NRCS regulation, it is only necessary to complete Parts I, III, V, and VI of Form AD-1006 and place the completed form in the project files. In accordance with 7 C.F.R. 658.2(a), the site is not considered Prime Farmland, and as such, is not governed by the provisions of the FPPA.

4.6.3 No Action

The No Action Alternative would not impact any farmlands.

4.6.4 Impact Avoidance, Minimization and Mitigation

The project will not impact protected farmlands; therefore, no mitigation is proposed.

4.6.5 References

AECOM. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

Burlington County Agriculture Development Board. 2008. Burlington County Comprehensive Farmland Preservation Plan (2009-2018). Burlington, NJ.

NJDA: State Agriculture Development Committee. 2013. Transfer of Development Rights.

USDA. Natural Resources Conservation Service: New Jersey. New Jersey Important Farmlands Inventory: Prime Farmlands. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018875>

USDA. Natural Resources Conservation Service: New Jersey. Unique Farmland Soils: Unique Farmlands. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018880>

USDA. Natural Resources Conservation Service: New Jersey. Soils of Statewide Importance. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018875>

USDA. Natural Resources Conservation Service: New Jersey. Farmland of Local Importance: Burlington County. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018873>

USDA. Natural Resources Conservation Service: Web Soil Survey. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

USDA. Natural Resources Conservation Service: Part 658- Farmland Protection Policy Act (7 C.F.R. 658).

4.7 Hazardous Materials, Solid Waste, and Pollution Prevention

NJDOT completed a hazardous waste screening on and in the vicinity of the airport to identify potential hazardous waste and/or contaminated sites/areas of concern (AOCs) that could affect project implementation, and evaluated the need for further investigation. In addition, the potential for project construction to generate significant amounts of solid waste was evaluated as was the potential for project implementation to result in adverse effects to human health and the environment.

Based upon the nature of identified sites and areas of concern, as well as the relationship to the planned construction, the relative risk that each site/AOC could pose to the Proposed Action was ranked as high, moderate, or low. NJDOT anticipates that the majority of the construction activities can be accomplished with ground disturbance occurring at depths no greater than approximately three feet below the existing ground or pavement surface. Preliminary information also indicates that dewatering would not be necessary to accomplish construction. NJDOT will reevaluate the relative risk of encountering hazardous waste or contaminated materials during subsequent design phases when more detailed information is developed regarding construction techniques and excavation depths.

4.7.1 Existing Conditions

NJDOT identified six sites/AOCs with some level of potential to affect Proposed Action implementation. The relative risk each site or identified area of concern (AOC) could pose to the project was ranked as high, moderate, or low as described below:

High Potential — Sites ranked with high potential to affect project implementation are those located on or adjacent to the envisioned project construction area(s), and are anticipated to have soil and/or groundwater contamination extending into the project area, which is expected to be encountered during project excavation, grading and/or dewatering activities. High potential sites may also have contamination that could impact property acquisition.

Moderate Potential — Sites ranked with moderate potential to affect project implementation are those located adjacent to, or in proximity to the envisioned project construction area(s) that may have a history of releases, or may conduct business operations which are likely to use petroleum products or other hazardous substances in their processes, but where no active releases are documented. Moderate potential sites could have ongoing or completed remediation activities, where the potential to encounter residual contamination may not appear imminent, but cannot be ruled out. Moderate potential sites may also be considered possible sources of undocumented contamination which may be encountered during construction, but where no indications of a release or, material threat of a release were apparent at the time of the assessment.

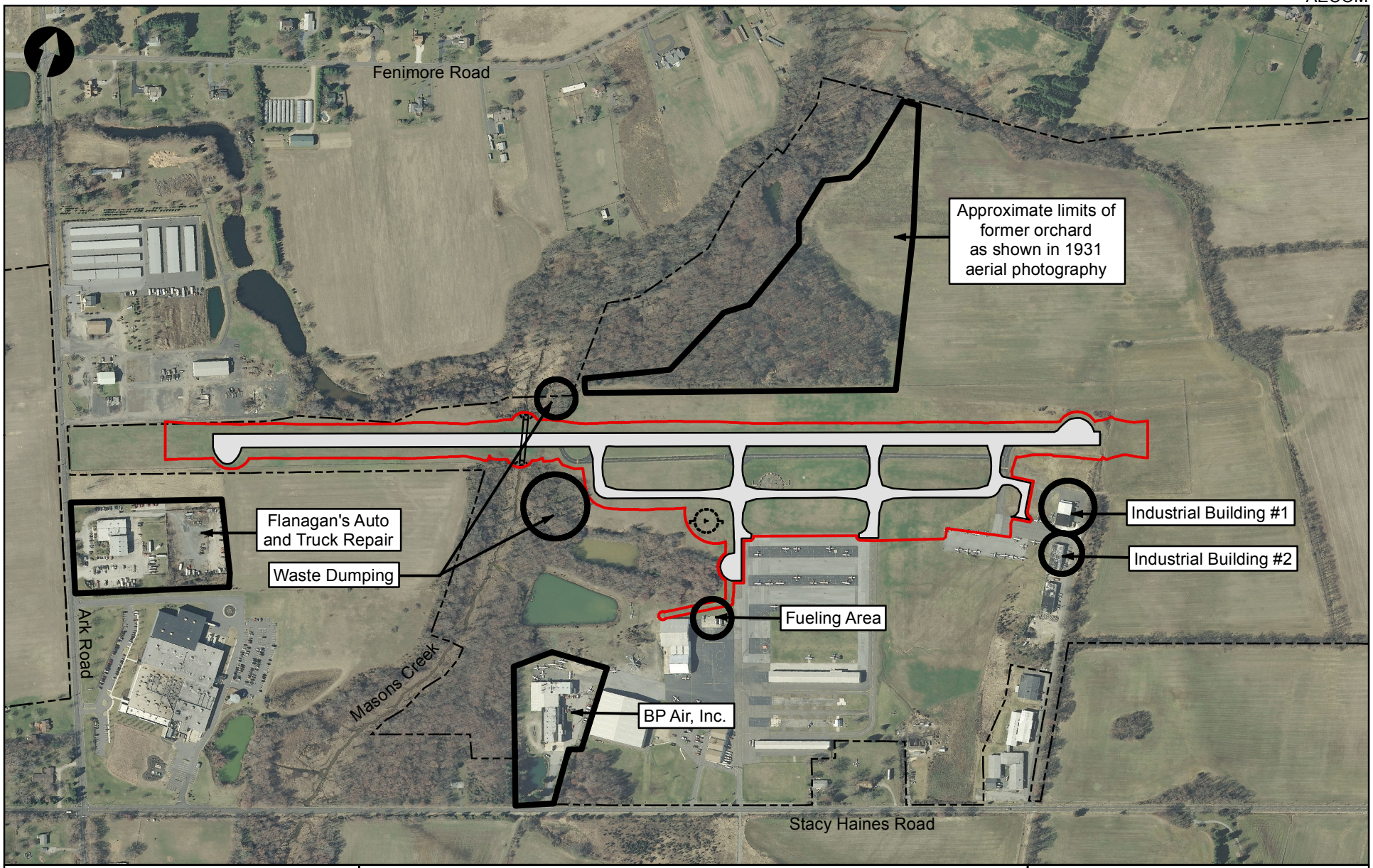
Low Potential — Similar to moderate potential, sites ranked with a low potential to affect project implementation are those that may be located adjacent to, or in proximity to, the envisioned project construction area(s), may have a history of releases, or may conduct business operations which are likely to utilize petroleum products or other hazardous substances in their processes. For low potential sites, such factors as previous remediation efforts, distance of the site location from the project construction activities, topographic position, anticipated groundwater flow direction, hydraulic barriers, etc., significantly reduce the likelihood of project involvement.

Two of the identified sites/AOCs are ranked as low potential to affect project implementation and four of the sites/AOCs are ranked as moderate potential as discussed below (Figure 4.7-1). No high potential sites were identified.

Flanagan's Auto & Truck Repair – This site is located adjacent to the airport at 98 Ark Road. The site is not identified on the NJDEP's Known Contaminated Sites List, but conducts or has conducted business operations which are likely to use petroleum products or other hazardous substances. At the time of the preparation of this EA document, the site was not in operation. The site is at approximately the same elevation as the airport, and is located approximately 350 feet south of the nearest project-related construction area. Based on a lack of reported releases and distance from the proposed improvements, this site is considered to have low potential to affect project implementation, and no further action is recommended.

BP Air, Inc. – This is an operating aviation maintenance and refurbishment business located at 70 Stacy Haines Road. The facility has access to the airport through paved areas adjacent to the Air Victory Museum and is located approximately 350 feet from the nearest project-related construction area. This property is located at approximately the same elevation as the airport and drains to wetlands associated with an upstream section of Masons Creek. The site is not identified on the NJDEP's Known Contaminated Sites List, but conducts business operations which are likely to use petroleum products or other hazardous substances. Based on a lack of reported releases and distance from the proposed improvements, this site is considered to have low potential to affect project implementation, and no further action is recommended.

Industrial Building #1 – A review of the NJDEP Geographic Information System (GIS) databases indicates that the airport is on the New Jersey Known Contaminated Sites List as an active site (Program Interest #331504); however, the site is not mapped by NJDEP as containing a groundwater Classification Exception Area/Well Restriction Area (CEA), a Currently Known Extent of groundwater contamination designation (CKE) or a deed



600 0 600

Feet

Legend

Project Area

Airport Property

Notes:
1) All areas are approximate and generalized based on field inspection and NJDEP case file information.
2) In addition to areas identified on the map, potential background soil contamination may be encountered throughout the project limits of disturbance.

Areas of Potential Hazardous Waste Involvement
New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 4.7-1

notice. According to NJDEP Data Miner online records, NJDEP oversight commenced in 2007 under the Bureau of Field Operations (BFO070001) and was then transferred to the Licensed Site Remediation Professional (LSRP) Program in 2012 where it remains active (LSR120001).

Available NJDEP Site Remediation Program files indicate that this contamination case was prompted by a February 2000 Environmental Site Assessment which identified two septic fields on the property. A 2003 Phase II investigation of the septic systems revealed arsenic in soil and arsenic, lead and trichloroethylene (TCE) in groundwater. The Phase II investigation also included soil sampling from "an adjacent agricultural area" (no map provided) to assess background concentrations of arsenic and lead. This subsequent soil sampling appeared to correlate these concentrations to naturally occurring and/or background soil conditions associated with glauconitic soils (see discussion of Potential Background Soil Contamination below).

To investigate the TCE in groundwater, three monitoring wells were installed in 2003, which were sampled in December 2003, January 2004, January 2007 and May 2009. Various metals and TCE have been identified in groundwater during these sampling events, in exceedance of NJDEP criteria. According to the reports, the metals contamination identified within groundwater was attributed to background soil conditions and the presence of sediments in the groundwater samples. The case files point to discharges through the septic system as the source of the TCE contamination in groundwater. Groundwater is noted in the case file as occurring approximately 13' below the ground surface and flowing north-northwesterly.

Industrial Building #1 is located adjacent to the East Apron and the system in question is located approximately 90 feet to the north of the building, in a lawn area at the end of the eastern access road. During the site inspection, one monitoring well was observed, which appears to be #MW-2 based on the mapping and other information in the NJDEP case file. Based on the active contamination case, field conditions, historical aircraft maintenance activities, and relative proximity, this site presents a moderate potential to affect Proposed Action implementation (See Section 4.7.2, Proposed Action).

Fuel Storage Area – At the time of the assessment, two 12,000-gallon above ground fuel storage tanks were observed on a concrete pad adjacent to Community Hangars #2 to #4. The concrete pad is curbed and sloped to contain spills and contains a drain, which connects to an adjacent oil interceptor. The tanks are vaulted and contain Jet-A fuel (Jet-A) and 100 low lead aviation gasoline (AVGAS). One 275-gallon waste oil tank was also observed within a secondary containment. Several 55-gallon drums and smaller containers of unknown substances were also observed on the storage pad. Evidence of minor staining was noted, as was evidence of a former fire, which was documented in a previous EA for the airport prepared in 1999. Based on the proximity to the proposed construction, this area has moderate potential to affect project implementation. (See Section 4.7.2, Proposed Action).

Waste Dumping – At the time of the assessment, evidence of waste dumping was noted in various areas throughout the property. For the most part, the dumping was noted in areas beyond the project limits of disturbance and appeared to be historical in nature, related to the former farmstead use and historical airport operations. The waste predominantly included old bottle dumps and trash piles, piles of soil—sometimes mixed with solid waste, and piles of construction and demolition debris. Some potential hazardous waste was also noted, including a few 55-gallon drums and a discarded 275-gallon above ground storage tank. At the time of the assessment, the drums and tank appeared empty and no staining, stressed vegetation or evidence of a release was noted in the immediate vicinity. The waste dumping was generally noted downgradient of the proposed limits of disturbance. Based on the proximity, topographic gradient and nature of the proposed construction, the dumped waste materials appear to present moderate potential to affect project implementation (See Section 4.7.2, Proposed Action).

Industrial Building #2 – This building is located approximately 250 feet from the project limits of disturbance and contained a flight club and coffee shop at the time of the assessment. Maintenance is performed on aircraft in and around the building; therefore, this site presents moderate potential to affect project implementation (See Section 4.7.2, Proposed Action).

Potential Background Soil Contamination – In addition to the specific sites/AOCs identified during the assessment, there is moderate potential for Proposed Action construction to encounter background contaminants in soils, due to possible historical pesticide applications, as well as natural soil conditions.

Historic aerial photography (back to 1931) and historical U.S.G.S. maps (back to 1942) show that the area to the north of the runway, immediately east of Masons Creek was once an orchard. This area is not located within the proposed construction area, but is located approximately 115 feet from the currently envisioned limits of disturbance. As previously indicated, soil sampling from "an adjacent agricultural area" was performed to assess background conditions as related to investigation of Industrial Building #1. While no map was provided, this sampling is believed to have been conducted in the field adjacent to the Runway 26 end, and appeared to attribute arsenic concentrations to naturally occurring and/or background soil conditions associated with glauconitic soils. According to NJDEP, the Holmdel, Marlton and Kresson soil series, which occur on the site, commonly contain naturally occurring levels of arsenic (See Section 4.7.2, Proposed Action).

4.7.2 Proposed Action

Adverse, long-term operational impacts related to hazardous materials and solid waste are not anticipated to occur as a result of the Proposed Action. Airport fueling and hazardous waste handling and disposal operations would not change as a result of the project.

For those sites/AOCs where potential contamination would generally be apparent via visual and/olfactory observation (including Industrial Building #1, the Fuel Storage Area, Waste Dumping and Industrial Building #2), the NJDOT will perform monitoring during construction and sampling of suspect material to confirm or deny the presence of contamination. In addition, NJDOT will analyze any excess soils for waste classification, and will dispose of the excess materials in accordance with federal, state and local regulations.

Generation of regulated waste is typical of airport construction projects; however, an increased volume may be generated as a result of excavation of questionable soils. These impacts would not be considered adverse; however, certain controls must be implemented and procedures must be followed to avoid and minimize impacts associated with construction in potentially contaminated areas as discussed in Section 4.7.4 below.

4.7.3 No Action

Under the No Action alternative, the facility's involvement with hazardous materials or solid wastes would remain similar to the present day condition.

4.7.4 Impact Avoidance, Minimization and Mitigation

Hazardous materials and solid waste related impacts are expected to be limited to the construction period. Restricting public access to the construction area, implementation of dust control measures pursuant to the NJDOT Soil Erosion and Sediment Control Standards, and development and adherence to a Site-Specific Health and Safety Program (HASP) are expected to effectively limit the potential for exposure to contaminated media during construction.

If contamination is confirmed, NJDOT would identify a Licensed Site Remediation Professional (LSRP) to oversee the management of contaminated media encountered during construction pursuant to the NJDEPs Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C), Technical Requirements for Site Remediation (N.J.A.C. 7:26E) and other applicable rules and guidance.

In addition to following LSRP oversight as applicable, strict adherence by NJDOT to Materials Handling Plans and Pollution Prevention and Control Plans, are expected to limit any logistical challenges associated with construction within potentially contaminated areas.

4.7.5 References

AECOM Site Inspections and contacts with site personnel conducted between February 2017 and April, 2017.

NJDEP GIS databases, including the Known Contaminated Sites List, Currently Known Extent and Classification Exception Areas.

NJDEP Data Miner < https://www13.state.nj.us/DataMiner>.

NJDEP Case Files reviewed on March 29, 2017, including excerpts from: Remedial Investigation Report by Keating Environmental Management, Inc., dated March 2007; South Jersey Regional Airport Work Plan by Keating Environmental Management, Inc., dated January 5, 2009; Supplemental Remedial Investigation by Keating Environmental Management, Inc., dated July 2009 as well as various related notes, maps and correspondence.

NJDEP Site Remediation and Waste Management Program. 2016. Historically Applied Pesticide Site Technical Guidance, Version 2.0.

NETR Online <https://www.historicaerials.com>, accessed December 2017.

4.8 Historic, Archaeological, Architectural and Cultural Resources

This section addresses the potential effects of the Proposed Action on historic properties. Historic properties potentially affected by the Proposed Action are federally-regulated under the National Historic Preservation Act (NHPA) as well as other applicable laws and regulations intended to protect sites listed or eligible to be listed on the National Register of Historic Places (NRHP). Pursuant to Section 106 of the NHPA, through consultation with stakeholders, federal agencies must take into account the effects of their actions on eligible or listed historic properties, work together to avoid, minimize, or mitigate adverse effects, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment.

For this project, a cultural resources investigation was conducted (see Appendix D) and the New Jersey Historic Preservation Office (NJHPO) was consulted (see Appendix A) to determine the effects of the Proposed Action on historic properties.

4.8.1 Existing Conditions

4.8.1.1 Area of Potential Effects

Under 36 CFR 800.16(d), the Area of Potential Effects (APE) is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties if any such properties exist." The APE for archaeology is typically defined as the LOD of the proposed undertaking to the physical environment (natural or man-made). This would include the footprint of the proposed improvements and any other areas of ground disturbance that are associated with the proposed construction. The APE for architecture may be more expansive and, in addition to physical changes to a

property, must also consider visual, audible and atmospheric changes that could impact the character and setting of an historic property. Because the project will not require removal of any structures, and the majority of the work is extremely low in profile and peripheral vegetation limits the views of and from the nearby historic properties, only those structures adjacent to the proposed project were assessed.

4.8.1.2 Past Studies

A cultural resources investigation of VAY was conducted by Richard Grubb & Associates (RGA) in 1999, for three alternatives for proposed airport expansion. That survey encompassed the current project APE and included both an assessment of the archaeological sensitivity of the APE as well as an architectural survey of properties potentially eligible for listing on the NRHP (Leynes et al. 1999). Leynes et al. (1999:9-11, 9-12, 9-23, 9-28) recommended Phase IB archaeological testing in any area of proposed ground disturbance on or surrounding the airport property, due to the number of recorded prehistoric sites in the area and the presence of perennial sources of water (East and West branches of Masons Creek) on the airport property. Prehistoric artifacts have also been reported in the agricultural fields west of Ark Road in and around the APE (Jack Cresson, personal communication with Joel Dworski, M.A., RPA of AECOM, February 2015).

The 1999 architectural survey conducted by RGA included seven properties surrounding the airport with structures potentially eligible for NRHP listing (Leynes et al. 1999). None of those structures are situated within the APE for this project. At that time, none of those identified properties were found eligible for NRHP listing as individual resources, but subsequent to the original survey, RGA (2000) defined the Lumberton Rural Agricultural District (Figure 4.8-1), which has been determined eligible for NRHP listing (SHPO Opinion 9/12/2001). The boundary of this district is located to the east of the APE.

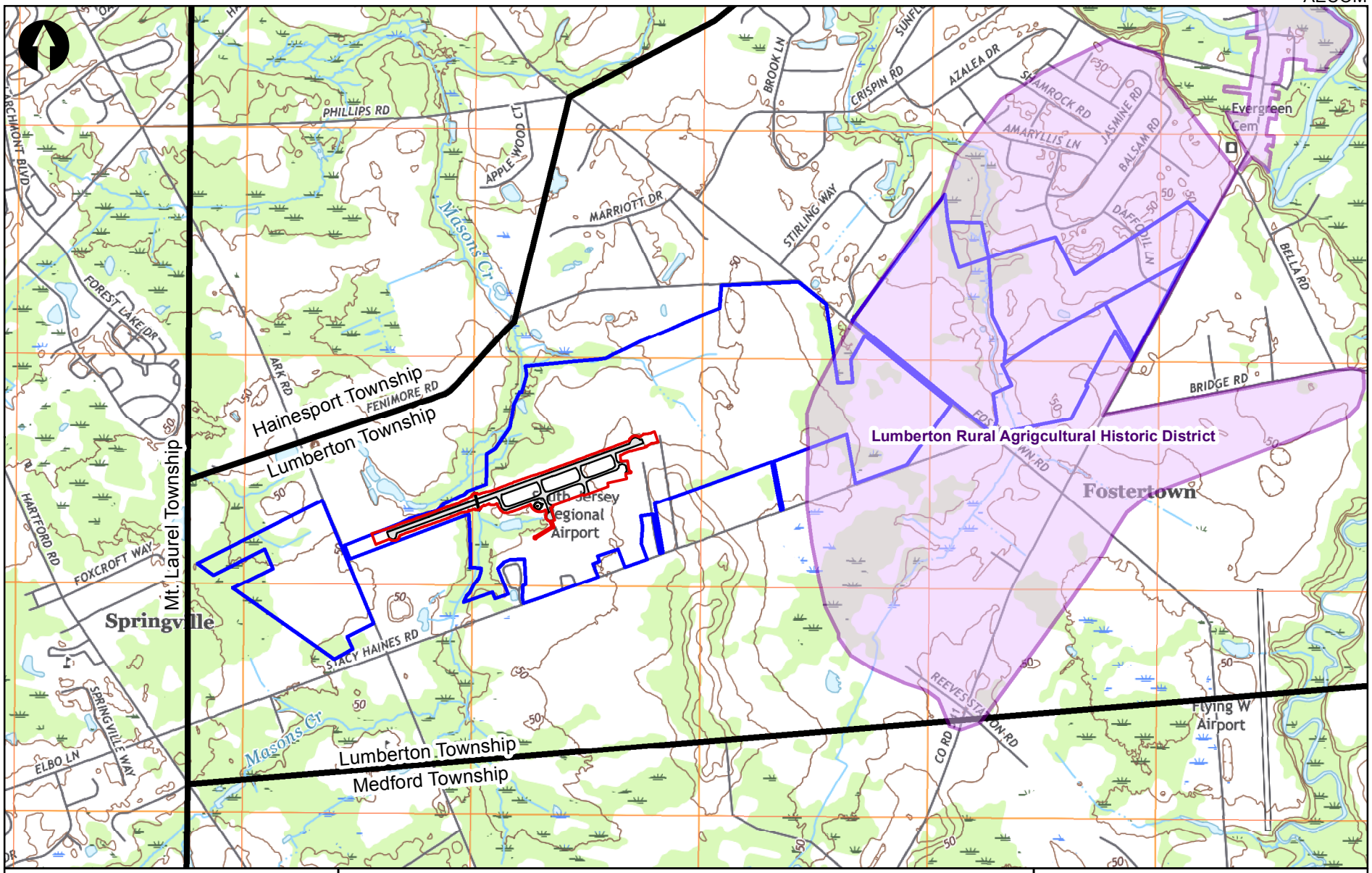
4.8.1.3 Historic Architectural Resources (Current Studies)

A reconnaissance level architectural survey was conducted and two hangar structures were determined to be located within the APE. These structures were built during the period from the 1960's to 1996-7 and exhibit interior and exterior alterations. These hangar structures are utilitarian in nature, and related to the airport's function. They have no relationship to the Lumberton Rural Agricultural District. Consequently, neither was determined eligible for listing in the NRHP.

4.8.1.4 Archaeological Resources (Current Studies)

A pedestrian reconnaissance of the current project area was conducted on February 27, 2017 by AECOM archaeologists. During the field visit it was observed that a number of hydrographic features and landforms that are potential indicators of increased prehistoric settlement sensitivity persist largely unchanged in the 18 years since the RGA survey. In locations where soil profiles were visible, the soils appeared to retain depositional integrity. Based on observations from this field visit, the previous designation of the project area as high sensitivity for prehistoric resources put forth by Leynes et al. in 1999 was corroborated. The two historic farmsteads identified by Leynes et al. (1999) as potential archeological sites are located outside of the APE for the current project.

The presence of archaeological resources within the APE was further investigated in September and October, 2017 by NV5 archaeologists. Consultation with SHPO in July, 2017 resulted in a determination that the eastern portion of the APE has little potential for archaeological resources and did not require testing. The remainder of the APE was subject to Phase IB testing via a program consisting of 284 shovel tests, with the majority placed at 50' intervals along a series of east/west transects. The Phase IB testing identified a light scatter of historic materials dating from the second quarter of the 19th century through the early 20th century in a



2,000 0 2,000

Feet

Legend

- Historic Districts
- Project Area
- Airport Property

Cultural Resources

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USGS Mount Holly US Topographic 7.5' quadrangle and NJDEP GIS

Figure 4.8-1

plowzone context that was undoubtedly related to the agricultural use of the land, a few isolated Contact period artifacts from disturbed contexts or considered isolated finds, and a concentration of Pre-Contact lithics that were located to the north of the runway and east of Masons Creek. Although outside of the Limits of Disturbance, this area was subject to limited Phase II investigations to provide additional information about the site's integrity and develop a preliminary assessment of its eligibility for listing in the NRHP. The site has been registered as an addendum to 28-Bu-62, the Airpark-N (a.k.a. Adamski) site, with the NJ State Museum.

The identified site is believed to represent the southern edge of site 28-Bu-62, which was previously recorded in 1938 and again in 1984. The Phase I/II efforts were able to define the southern limits of the site sufficiently to determine that the site lies wholly outside of the project LOD. The site may also be part of, or associated with, previously recorded site 28-Bu-324, and both may actually represent one multicomponent site or a larger site complex. This site has not been evaluated as a whole for National Register eligibility because the current project has no potential to affect it.

4.8.2 Proposed Action

The Lumberton Rural Agricultural District's boundary is located outside the APE, and no other National Register eligible or listed historic districts or structures occur within the APE of the Proposed Action. The Pre-Contact archaeological site identified during testing lies wholly outside of the project LOD.

Based on a finding of no historic districts or structures within the APE, no intact archaeological deposits witin the APE, and avoidance of the identified archaeological site, NJHPO concurred with the finding that no historic properties will be affected by the project (Appendix A).

4.8.3 No Action

Under the No Action Alternative no historic properties would be affected.

4.8.4 Impact Avoidance, Minimization and Mitigation

Because no historic properties will be affected by the proposed undertaking, no mitigation will be required.

To provide appropriate protection to the Pre-Contact site during construction, the following measures will be taken:

- All proposed work, including construction access, staging areas, and project construction will be specifically precluded from using any part of the identified site via substantial fencing.
- Project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction.
- Permanent survey markers will be installed to assist with accurate relocation of the site in the future.

4.8.5 References

Richard Grubb & Associates. Leynes et al. 1999. Cultural Resources Investigation of South Jersey Regional Airport.

36 CFR PART 800 – Protection of Historic Properties.

Public Law 89-665; 54 U.S.C. 300101 et seq. The National Historic Preservation Act (NHPA).

NV5. 2017. South Jersey Regional Airport Cultural Resources Survey Phase I End-of-Fieldwork Memorandum and Management Summary.

NV5. 2018. Cultural Resource Survey (Draft, February 2018), South Jersey Regional Airport Widening of Runway 8-26 and Ancillary Improvements, Township of Lumberton, Burlington County, New Jersey.

Section 106 Consultation Comments, Rappleye to Marcopul 10/26/17 with concurrence dated 11/13/17.

4.9 Land Use

This section describes existing land use, zoning, and public policy, as well as community facilities within or servicing the study area. This section also addresses the compatibility of the Proposed Action and No-Action Alternatives with existing land use policies. The potential for noise impacts on incompatible land uses is discussed in Section 4.11.

4.9.1 Existing Conditions

4.9.1.1 Land Use

Existing on-airport land use includes the airfield, the terminal building and related landside facilities, aircraft maintenance and industrial areas and open space, much of which is being actively farmed. Environmentally sensitive areas within the airport property include waterways, wetlands and floodplains associated with Masons Creek. Existing land uses in the vicinity of the airport include a mix of agricultural lands, woods and wetland areas, low-density residential developments and industrial and commercial establishments—primarily along the eastern side of Ark Road. Adjacent to the airport, several existing homes are scattered along the surrounding roadways, including Stacy Haines, Masonville-Fostertown, and Ark Roads.

4.9.1.2 Zoning

Lumberton has implemented zoning regulations as documented in Chapter 130 of the Township Code. In addition, Title 16, Chapter 62 of the New Jersey Administrative Code, Air Safety and Zoning, identifies minimum statewide standards for the control of airport and aeronautical hazards and standards for land use adjacent to airports. Municipalities are required to implement and maintain land use ordinances in accordance with the provisions of this chapter as further discussed below. Zoning and Airport Safety Zones (ASZ) are shown on Figure 4.9-1. The airport property falls within various zoning designations. Local zoning and the state-mandated Airport Safety Zone are summarized below:

RI Rural Industrial District – Most of the existing runway and airport operations occur within this district. This district was added in August of 2002 by Ordinance No. 2002-8. Airports are not a principal permitted use in this district, but the district allows airports and related general aviation related operations as a conditional use, as long as this conditional use does not result in the expansion or enlargement of the runways or operations. The majority of the proposed runway and taxiway improvements will occur in this district, as permitted pursuant to the ASZ (further discussed below).

RA/S TDR Sending Area District – The very edge of runway end 26 occurs in this district. The purpose of this district is to provide an area which may be either developed in accordance with the standards of the RA Rural Agricultural District, or for the TDR in accordance with the Township's TDR program, which was implemented in 1989 as a farmland preservation measure. Airports are not a permitted use within this zoning district. A

portion of the proposed runway and taxiway improvements will occur in this district, as permitted pursuant to the ASZ (further discussed below).

I-3 Industrial 3 District – This district occurs along the western portion of the runway and along both sides of Ark Road. The purpose of the I-3 Industrial 3 District is to encourage industrial and commercial uses with relatively low volumes of large truck traffic that are compatible with the adjacent and nearby use of the South Jersey Regional Airport. No improvements are proposed within this zone as part of the Proposed Action.
RA/R-2 TDR Sending Area District – A small portion of one of the eastern adjacent properties occurs in this zone. The purpose and principal permitted uses in this district are similar to the RA/S TDR Sending Area District. No improvements are proposed within this zone as part of the Proposed Action.

RA/ST TDR Transition Area District – The majority of the eastern adjacent properties occur in this zone. The purpose and principal permitted uses in this district are similar to the RA/S TDR Sending Area District and RA/R-2 TDR Sending Area District. No improvements are proposed within this zone as part of the Proposed Action.

Airport Safety Zone – Lumberton Township has incorporated the state-mandated ASZ into the Township's regulations. The ASZ delineates an area surrounding public-use runways at airports licensed by NJDOT and overlays the local zoning. By definition, airports and airport-related facilities are compatible land uses and permitted activities within an ASZ. Thus, state regulations ensure licensed airports are not considered a non-conforming use, regardless of the permitted uses of the underlying zoning district.

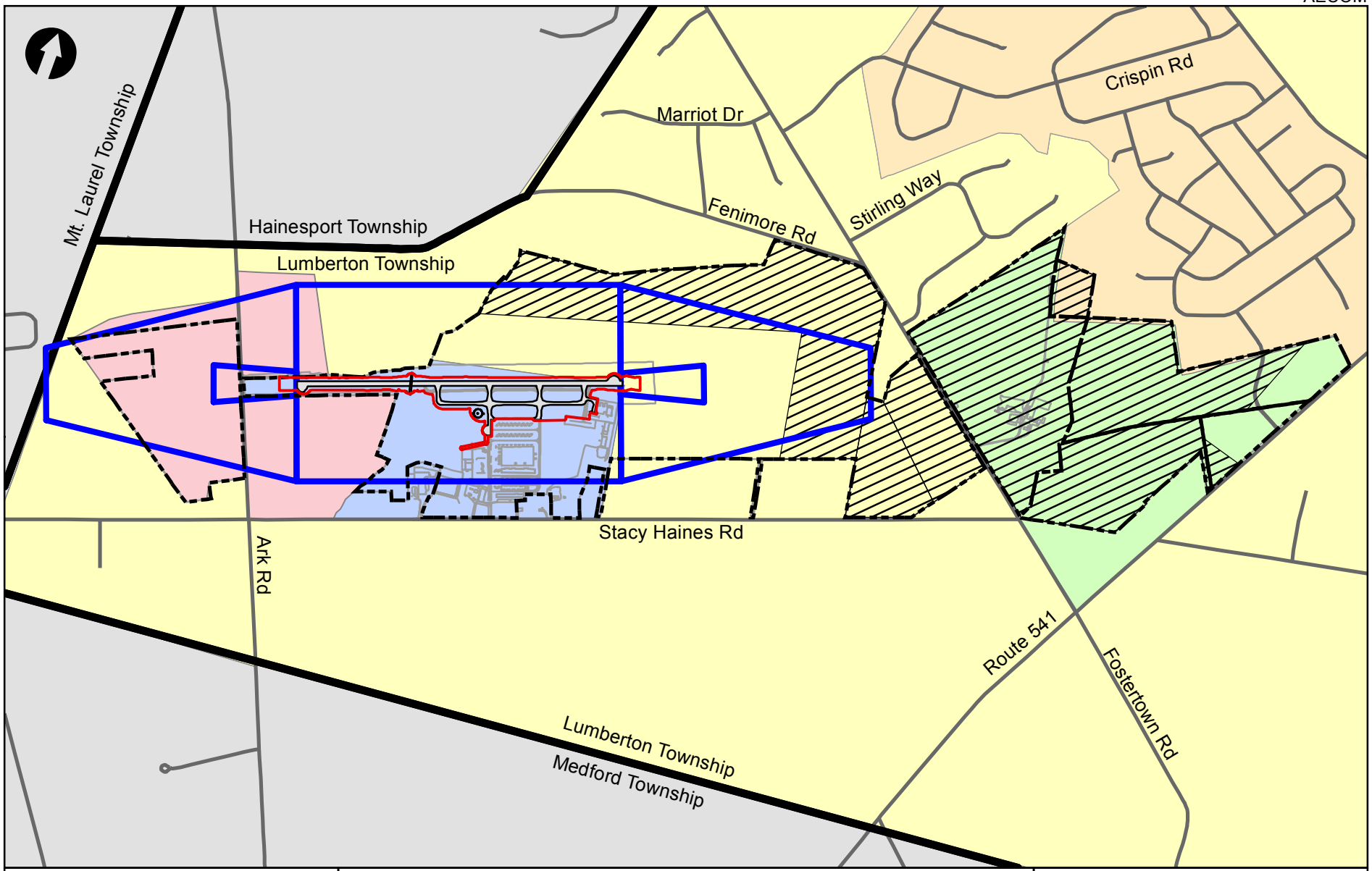
4.9.1.3 Encumbered Areas via Transfer of Development Rights

Sometime between 2006 and 2009, the previous airport owner enrolled portions of the airport site in the Township's TDR program, effectively selling the development rights and restricting future land use to agricultural uses or other uses as they existed at the time the conservation restriction was recorded. Based on a review of the Burlington County Comprehensive Farmland Preservation Plan (2009-2018) (adopted in December 2008), it appears that the preserved areas do not include the project area. Preserved farmland areas within the study area are show on Figure 4.9-1.

4.9.1.4 Community Facilities

There are no churches, hospitals, shopping centers or additional places of public assembly located within a one-mile radius of VAY. The few community facilities that exist within a one-mile radius of the airport include Springville Elementary School at 520 Hartford Road in Mount Laurel Township, the Burlington Special Services School, Lumberton Campus at 71 Ark Road in Lumberton Township and the Medford Fish and Wildlife Management Area located south of the airport across Stacy Haines Road.

Other community facilities serving the Township of Lumberton are located greater than a mile from the airport, including the Lumberton Police Department, Emergency Squad and Department of Public Works, all of which are located at the Municipal Complex, approximately 4 miles away. The Lumberton Township Volunteer Fire Department is located at 561 Main Street in Lumberton, about 3 miles from the airport. The nearest hospital to the airport, Virtua Memorial Hospital, is about 5 miles away in Mount Holly Township. There are many religious facilities servicing the area around VAY; the two closest, which are both over a mile away, are the Church of Jesus Christ in Mount Laurel and St. Anthony Orthodox Church in Medford. The closest library to the airport is the Mount Laurel Library located at 100 Walt Whitman Avenue in Mount Laurel Township, which is approximately 5 miles away.



Zoning Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: South Jersey Regional Airport Master Plan, Lumberton Township Zoning GIS, and Burlington County Comprehensive Farmland Preservation Plan

Figure 4.9-1

4.9.1.5 Compatibility with Local and Regional Land Use Plans

Various land use and comprehensive plans have been identified in the project region. Compatibility with these plans is discussed below.

New Jersey State Airport System Plan (SASP) – With reference to the New Jersey SASP (released in 2008), VAY's recommended functional role is service as a Priority General Service airport. Priority General Service airports should be able to accommodate some of the most demanding corporate aircrafts, including jets. All types of multi- and single-engine aircrafts operating for business, training, and pleasure can be anticipated at these airports. The Priority General Service Airport functional level was developed to identify those airports that contribute significantly to the system and should be upgraded to the Advanced Service functional level. These airports will offer a full complement of aviation related services and should be developed to the fullest extent possible. However, existing constraints at airports in the Priority General Service functional level may make preferred total airport expansion extremely unlikely or infeasible. The Proposed Action would improve safety associated with VAY's operation as a Priority General Service Airport.

Delaware Valley Regional Planning Commission (DVRPC) – With reference to the DVRPC Regional Aviation System Plan (RASP), VAY is designated as a Reliever Airport. Reliever Airports are those designated by the FAA in the National Plan of Integrated Airport Systems (NPIAS) to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community. Reliever airports must have at least 100 based aircraft or 25,000 annual itinerant operations according to FAA Order 5090.3C. The RASP takes a region-wide perspective, and attempts to be selective in its recommendations. The RASP recommends that VAY achieve the runway design standards by widening the runway to meet RSA criteria, which is consistent with the Proposed Action.

Lumberton Township Master Plan – According to the Lumberton Township Master Plan, the Township land use goal regarding airports is to recognize the historic role of the existing air transport facilities and support the continuance of the activities at the existing level and size. While the proposed airfield improvements will increase the width of the runway and provide for separation of the runway and taxiway, the Proposed Action is intended to bring the airport into compliance with FAA safety standards, and will not increase the level or size of the operations. Therefore, the project is consistent with applicable goals of the Master Plan.

Burlington County Parks and Open Space Master Plan – According to the Burlington County Parks and Open Space Master Plan, the airport falls within the Masons Creek/Rancocas Creek, Southwest Branch project area which aims to link existing and proposed public/private open space projects, supplemented by strategic hub site acquisition and development as necessary. Burlington County envisions the conversion of existing railroad rights-of-way to multi-use trails to connect the populace to all regions of the County. To do this, it will not require any impacts or alterations of existing land uses within the airport property. The Proposed Action will not prohibit or impact the potential for the county to implement its open space plan.

4.9.1.6 Wildlife Hazards

In accordance with the FAA Advisory Circular (AC) 150/5200-33B, Hazardous Wildlife Attractants on or near Airports, when considering proposed land uses, airport operators, local planners and developers must take into account whether the proposed land uses, including new development projects will increase wildlife hazards. Under the existing condition, the wetlands, waterways, and open/agricultural areas within the study area may be considered attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species.

4.9.2 Proposed Action

As indicated in Section 1.0 of this EA, the project is needed to meet FAA safety requirements; that is, the airport must improve the Runway Safety Area to the degree practicable. The Proposed Action is not expected to cause or contribute to any substantial land use changes within the project area or study area. The improvements would occur on existing airport property and within the existing ASZ. The existing zoning around the study area will not be altered as a result of the project, and, based on the state-mandated ASZ, the Proposed Action is consistent with local zoning. The Proposed Action is compatible with normal airport operations and is in compliance with 49 U.S.C. § 47107 (a) (10), of the 1982 Airport Act.

The Proposed Action will not disrupt community services or facilities, nor would it cause the relocation of residences or businesses. Community and socioeconomic impacts are further discussed in Section 4.12. Environmentally sensitive areas to be impacted include freshwater wetlands, freshwater wetland transition areas, floodplains, and riparian zones associated with Masons Creek. These impacts are not considered adverse and are described in Section 4.2.

Aside from additional paving, the Proposed Action would not notably or adversely alter existing land uses; therefore, the Proposed Action will not create any new wildlife hazards or adversely affect safe aircraft operations.

4.9.3 No Action

If the No Action Alternative is taken, no construction would occur and land uses and zoning on and off the airport property would remain unchanged.

4.9.4 Impact Avoidance, Minimization and Mitigation

No mitigation measures are warranted, thus none are proposed.

4.9.5 References

AECOM Transportation. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

Burlington County Department of Resource Conservation. 2002. Burlington County Parks and Open Space Master Plan.

Delaware Valley Regional Planning Commission (DVRPC). 2014. 2040 Regional Airport System Plan.

Federal Aviation Administration. 2007. Advisory Circular No. 150/5200-33B – Hazardous Wildlife Attractants On or Near Airports.

Lumberton Township Code § 130-71. Schedule of limitations. [Amended 4-17-1989 by Ord. No. 1989-6; 4-18-1988 by Ord. No. 1988-7; 8-7-1989 by Ord. No. 1989-8; 8-3-1992 by Ord. No. 1992-6; 3-21-1994 by Ord. No. 1994-2; 4-18-1994 by Ord. No. 1994-3; 4-3-1995 by Ord. No. 1995-4; 7-17-1995 by Ord. No. 1995-10; 9-5-1995 by Ord. No. 1995-17].

NJ Department of Environmental Protection (NJDEP). 2015. Land Use/Land Cover 2012 Update (Generalized), Edition 20150217 (Land_lu_2012_gen).

Wilbur Smith Associates. 2007. New Jersey State Airport System Plan. Prepared for the New Jersey Department of Transportation.

4.10 Natural Resources, Energy Supply and Sustainable Design

FAA policy supports developments displaying environmental sustainability. To comply with the CEQ regulations, FAA environmental documents must evaluate potential impacts on supplies of energy and natural resources needed to build and maintain airports, in order to promote environmental sustainability. This section describes the potential for the Proposed Action to affect energy supply and use of natural resources.

4.10.1 Existing Conditions

South Jersey Regional Airport, like any airport facility, requires energy in the forms of electricity, natural gas, aviation fuel, diesel fuel, and gasoline to power, cool, heat, and to provide lighting. Natural resources such as water, sand, gravel, wood, concrete and steel are also consumed for the operation of the facility to varying levels. Some of these products are mainly consumed during airport construction and maintenance projects.

4.10.2 Proposed Action

The Proposed Action is designed as an airport safety improvement project to bring the airfield up to FAA standards, not to increase the airfield capacity of the airport. The Proposed Action does not include the construction or improvements to any buildings within the airport property. The improvements are restricted to the widening and grading around the existing runway, removal of the old taxiway, construction of a new taxiway and replacement of runway and taxiway lighting.

Although the Proposed Action would require increased temporary energy use and natural resources consumption, when compared to the No-Action Alternative, these demands would not be considered significant. Specific impacts of the Proposed Action are further discussed below.

4.10.2.1 Utilities and Facilities

The proposed airport runway lighting will not require any major changes in energy facilities. No electrical upgrades will be required on the site, such as a new service line or construction of a new electrical substation.

4.10.2.2 Natural Resources

According to FAA Order 1050.1E, Change 1, Environmental Impacts: Policies and Procedures, the use of natural resources other than for fuel need be examined only if the project or action involves a need for unusual materials or those in short supply. The construction of the Proposed Action would not require any scarce or unusual building materials and the volume of consumable materials (concrete and fill material) would be available from local or regional suppliers.

4.10.2.3 Energy Consumption

From a long-term operational perspective, the runway/taxiway lighting will consist of high efficiency light-emitting diode (LED) lighting which will consume less energy than the existing airfield lighting system, resulting in a net beneficial impact.

Fuel consumption is not expected to be appreciably different with or without the project because the project will not increase airfield capacity. Average daily gasoline and diesel fuel consumed by arriving and departing vehicles would not change appreciably due to the runway and taxiway improvements. The improvements of the taxiway will allow for larger aircrafts currently utilizing the airport to use the taxiway instead of having to backtaxi the length of the runway as in the current condition.

During construction, additional gasoline and diesel fuel would be consumed by contractors and their employees traveling to and from the project site as well as the on-road vehicles and non-road construction equipment required to build the project. These increases would be temporary and are expected to diminish as the project nears completion.

4.10.2.4 Sustainable Design

The National Environmental Policy Act of 1969, as amended (NEPA) requires agencies to…"use a systematic interdisciplinary approach, which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making". The Proposed Action was developed to be consistent with sustainability principles encouraging a holistic approach to the planning process, in which economic viability, operational efficiency, natural resource protection and social responsibility were considered. The project is designed as a safety improvement project to comply with FAA design standards, while minimizing the environmental impacts associated with the Proposed Action.

Executive Order 13123, Greening the Government Through Efficient Energy Management (64 Federal Register 30851, dated June 8, 1999), encourages each Federal agency to expand the use of renewable energy in its facilities and for its actions. As the proposed project would not have a significant impact on energy usage at the Airport, no energy improvements are proposed besides the high efficiency LED airfield lighting upgrade.

4.10.3 No Action

The No Action Alternative would result in the continued operations at the airport with similar sustainability metrics and consumption of natural resources and energy (e.g., fuel and electricity) as part of the normal operation and maintenance of the facility.

4.10.4 Impact Avoidance, Minimization and Mitigation

No significant energy supply, natural resource, or sustainable design impacts would occur under the Proposed Action; therefore, no mitigation measures are warranted.

4.10.5 References

AECOM. 2015. South Jersey Regional Airport Master Plan Update.

FAA Order 1050.1E, CHG 1, Environmental Impacts: Policies and Procedures. March 20, 2006.

Executive Order 13123, Greening the Government Through Efficient Energy Management. 64 Federal Register 30851. June 8, 1999.

4.11 Noise and Noise-Compatible Land Use

This section addresses noise levels at and near VAY. Noise in the area is predominantly caused by on- and off-airport vehicular traffic within the surrounding roadway network and aircraft operations in VAY immediately adjacent areas.

4.11.1 Noise Fundamentals and Guideline on Land Use Compatibility

Noise is defined as sound that is undesirable because it interferes with speech, communication, and hearing; is intense enough to damage hearing; or is otherwise annoying. The decibel (dB), a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for the measurement of sound. A-weighted sound levels (dBA) are commonly used to account for the frequency response to the human ear. The

term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to deemphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The day-night average sound level (DNL) was developed to evaluate the total community noise environment and is the accepted unit for quantifying human annoyance to general environmental noise, which includes aircraft noise. It is the most commonly used measurement for the evaluation of community noise impacts. DNL takes into account the difference in perception and response between daylight, waking hours and nighttime, sleeping hours. DNL is defined as the A-weighted average sound level during a 24-hour period, with a 10-dBA penalty weighting applied to noise occurring during nighttime (10pm to 7am). The 10-dBA weighting accounts for the fact that noises at night are more perceptible because of lesser background noise levels.

In June 1980, the Federal Interagency Committee (FIC) on Urban Noise published guidelines relating DNL to compatible land uses. This committee was composed of representatives of the Department of Defense, the Department of Transportation, the Department of Housing and Urban Development, the EPA, and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted them for their noise analyses.

Following the lead of the committee, the FAA has adopted the concept of land use compatibility as the accepted measure of aircraft noise effect. The FAA incorporated the committee's guidelines in the Federal Aviation Regulations. Although these guidelines are not mandatory, they provide the best method to assess noise impacts in airport communities. In general, residential land uses are not compatible with an outdoor DNL above 65 dBA, and the extent of land areas and populations exposed to a DNL of 65 dBA or higher or a change in DNL level provides the criteria to assess and compare the noise impacts of alternative aircraft actions.

4.11.2 Existing Conditions

The airport existing noise contours as presented in Airport Master Plan (August 2015) indicate that no residential properties, schools, or other sensitive receptors are within the 65 DNL contour. Therefore, the existing land use around the airport is considered compatible under current airport flight operations. The closest sensitive receptors include:

- Several single family residential dwellings located along Stacy Haines Road, Ark Road and Fenimore Road in the area surrounding the airport. The nearest of these properties is located approximately 200 feet from the 65 DNL contour and approximately 700 feet from the proposed construction area.
- The Special Elementary/Secondary School for Handicapped located approximately 3,000 feet south.
- A private childcare facility, Kindercare, is located approximately 2,700 feet southeast.
- Springville School is situated approximately 4,000 feet west.
- St. Martin in the Fields Church is located approximately 6,200 feet east.

4.11.3 Proposed Action

The proposed project does not involve airport location, runway location, runway extension, or any other capacity enhancing elements that would permit operations by larger or noisier jet aircraft or increases in flight operations. Therefore, it is reasonable to conclude that there would be no change in the airport's noise exposure contours with or without the Proposed Action. No further operational noise analysis is warranted.

Temporary impacts from construction noise could occur under the Proposed Action. Construction activities would include mobilization, site preparation, and equipment and truck movement and use. Construction activities would occur intermittently at various locations on the airport. During construction activities, noise would increase due to the operation of equipment, increases in traffic from waste hauling activities or material delivery, and other construction-related sources. Construction noise would be short term, ceasing after activities are completed. Given the long distance from the closest sensitive receptor, a residential property located approximately 700 feet from the proposed project disturbance, construction noise impact would be minimal.

4.11.4 No Action

The No Action alternative will have no impacts on noise sensitive receptors.

4.11.5 Impact Avoidance, Minimization and Mitigation

No mitigation measures would be required under the Proposed Action.

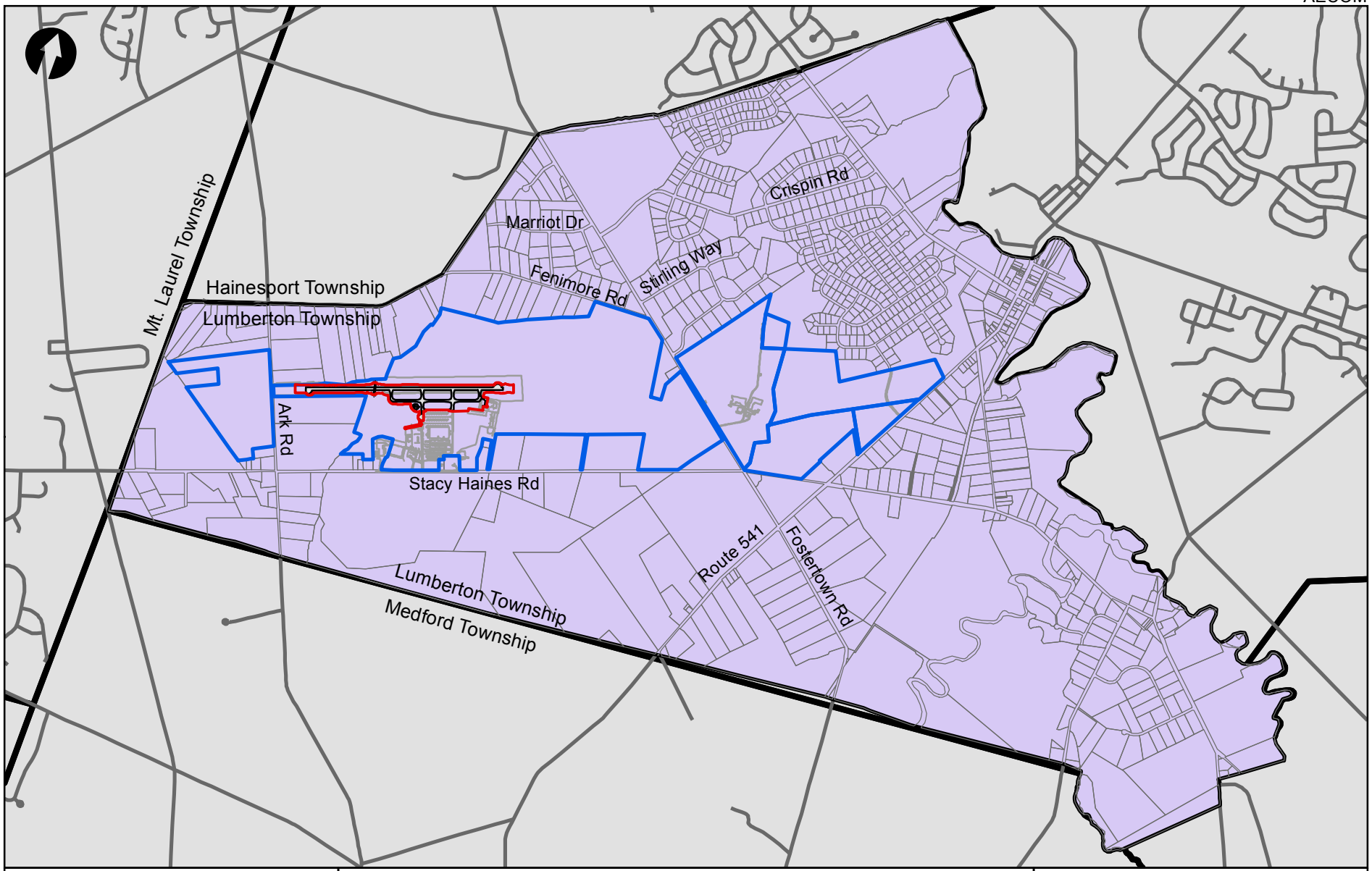
4.11.6 References

AECOM Transportation. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

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

This section describes economic and population characteristics of the area as a basis to assess potential socioeconomic impacts—including impacts to specially protected populations. In addition to evaluating potential social impacts on the general population, federal agencies are required to give special attention to disproportionate and adverse effects on minority and/or low-income populations as well as environmental health risks and safety risks that may disproportionately affect children. While the population of children is presumed to exist throughout the general population, Environmental Justice protected populations must be identified via a review of available demographic data.

In order to identify Environmental Justice protected populations, community racial characteristics were evaluated for the U.S. Census Bureau Block Group associated with the study area, and analyzed with comparison to Township, County, and State conditions. In addition, the percentage of the population living below the poverty level was evaluated with comparison between the study area Census Tract, County and State. Figure 4.12-1 depicts the location of the project area in relation to the Census Block Group.



Source: U.S. Department of Commerce, U.S. Census Bureau, Geography Division, and NJ Office of Information Tecnology, GIS, 2013, Trenton, NJ.

Figure 4.12-1

4.12.1 Existing Conditions

4.12.1.1 Demographics and Environmental Justice

According to U.S. Census Bureau data, the population of Lumberton Township was 12,559 in 2010, which represents a substantial, 20 percent increase from the 2000 Census. Population density as of 2010 was 965 persons per square mile, which reflects the township's developing, rural-suburban character. As of the 2010 Census, the racial composition of the township was approximately 71% White, 19% Black, 5% Asian and 5% others, including those identifying as one or more race. Approximately 6% of the population was Hispanic or Latino (any race). This racial composition is similar to that of Burlington County, but notably less racially diverse than the State as a whole.

The Census Block Group associated with the South Jersey Regional Airport (Tract 7031.02, Block Group 1) is notably less diverse than that of the Township. Census data from 2010 indicates that the population of the Block Group was 2,673. Approximately 84% of the Block Group's population was White, followed by Black (9%), Asian (5%), and others (2%), including those identifying as one or more race. Approximately 3% of the Block Group's population was Hispanic or Latino (any race).

A review of poverty data from the American Factfinder, 2011-2015 American Community Survey indicates that Census Tract 7031.02 had less than 1% of the population living below the poverty level, while Burlington County had approximately 6% and the State of New Jersey had almost 11% below the poverty level.

Based on this analysis, it is clear that the community associated with the study area is not an Environmental Justice protected population.

4.12.1.2 Employment

The main employment center in Lumberton Township is located approximately 3 miles northeast of the airport along the Route 38 corridor and along the Mount Holly Bypass. Major employers in the township include the CVS Corporation's distribution center, Walmart and Lowes Home Improvement. Until recently, Radwell International was also a major employer in Lumberton; however, the facility moved its corporate headquarters to Willingboro, NJ in early 2016.

The study area also contains a small employment cluster consisting of the airport itself, as well as adjacent businesses along Stacy Haines Road and Ark Road. The airport generates economic activity by supporting employment, contributing to wage earnings, and supporting economic activity for the local economy. The airport and associated industrial tenants presently employ approximately 50 people. Aeronautical and non-aeronautical businesses in the immediate area are identified in Table 4.12-1 below.

TABLE 4.12-1
Businesses in and around South Jersey Regional Airport

Commercial Establishment	Address	On Airport	Primary Business Activities
VAY Airport Operator	68 Stacy Haines Road	Yes	General aviation facility
Runway Cafe	68 Stacy Haines Road	Yes	Airport restaurant
TailSpinners	68 Stacy Haines Road	Yes	Aviation club/flight school/facility and aircraft rentals/coffee shop
FIRST AERO GROUP	68 Stacy Haines Road	Yes	Flight training school
Crewdawg Aviation, LLC	68 Stacy Haines Road	Yes	Aircraft maintenance and repair
Grass Masters, Inc.	68 Stacy Haines Road	Yes	Landscaping
Landstar	68 Stacy Haines Road	Yes	Transportation Solutions
Wings Agency Aviation Insurance	1924 Ark Road/ 68 Stacy Haines Road	Yes	Aviation insurance
BP Air, Inc.	70 Stacy Haines Road	No	Aircraft maintenance and refurbishment
Peco, Inc.	70 Stacy Haines Road	No	Distributor of printers and supplies
CCL Label, Inc.	92 Ark Road	No	Commercial printing
Richard May Tree Services, Inc.	106 Ark Road	No	Tree removal, trimming, etc.
Jest Notes and Baskets	106 Ark Road	No	Gifts
Enviropore, Inc.	106 Ark Road	No	Laboratory Supply
Ransome Equip-LRHR	106 Ark Road	No	Construction Equipment
Ryan Property Solutions	106 Ark Road	No	Landscaping
Stoneedge, LLC	106 Ark Road	No	Stone products supplier
Ark Road Storage, LLC	108 Ark Road	No	Self-storage facility
Hainesport Tool & Maintenance, Inc.	1924 Ark Road, Hainesport	No	Machine shop
J.E.C. Contracting, LLC	4104 Grenwich Ln, (Mount Laurel)	No	Contracting

Source: AECOM interviews and windshield inspection, January 2017

4.12.2 Proposed Action

The Proposed Action would not require the displacement or relocation of residents, homes or businesses. No right-of-way acquisition would occur; therefore, there will be no loss in the community tax base. All of the improvements will occur on the airport property; therefore, surface traffic patterns would not be affected. The Proposed Action will not allow the airport to accept larger aircraft, or change operations in any way; therefore, the project is not expected to cause induced, or secondary socioeconomic impacts to the surrounding community.

The Environmental Justice analysis indicated that there are no protected populations within the study area. Nevertheless, no noise, environmental health or environmental safety risks have been identified that would affect any person of any racial composition, income level or age. Therefore, there would be no

disproportionate adverse effects on Environmental Justice populations, or disproportionate health and/or safety risks to children.

4.12.3 No Action

The No Action alternative would have no effect on Socioeconomics, Environmental Justice, and Children's Health and Safety Risks.

4.12.4 Impact Avoidance, Minimization and Mitigation

There are no adverse impacts anticipated; therefore, mitigation measures are not warranted.

4.12.5 References

AECOM. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

AECOM. Interviews with Lumberton Township and local area businesses, conducted January 2017.

Burlington County Bridge Commission. 2015. List of Top Employers in Burlington County. http://www.bcbridges.org/Portals/0/EconDev/Top%2030%20Employers%202015.pdf

Executive Order 12898. 1994. 59 FR 7629. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

U.S. Census Bureau; Decennial Census; 2000 SF1 100% Data: Block Groups within Burlington County, New Jersey; Summary File (SF 1)

U.S. Census Bureau; Financial Characteristics; 2006-2010 American Community Survey 5-year Estimates: Burlington County, New Jersey; Table S2503

U.S. Census Bureau; Financial Characteristics; 2006-2010 American Community Survey 5-year Estimates: Lumberton Township, Burlington County, New Jersey; Table S2503 and S1701

U.S. Census Bureau; Financial Characteristics; 2006-2010 American Community Survey 5-year Estimates: New Jersey; Table S2503

US Census Bureau; U.S. Department of Commerce, U.S. Census Bureau, Geography Division; Census Blocks (2010) in New Jersey, Edition 20140523 (Govt_census_block_2010); Washington, D.C.; <http://www.census.gov/geo/www/tiger> (2010).

4.13 Visual Effects

This section provides an overview of the analysis of impacts from light emissions and visual effects from the components of the Proposed Action. FAA requirements for addressing light emissions and visual impacts under NEPA are addressed in FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions, and FAA Order 1050.1E, Change 1, Appendix A.12. This section provides an overview of the analysis of impacts from light emissions and visual effects from the components of the Proposed Action.

4.13.1 Existing Conditions

The project area's visual environment currently consists of maintained lawns with runways, taxiways, roads, and other runway support elements. The area surrounding the project area consists of a mix of agricultural and wooded areas to the north, west and east, and the General Aviation and Terminal Facilities to the south.

Lighting in the airfield is currently composed of Medium Intensity Runway Lights (MIRL), Precision Approach Path Indicators (PAPI), and Runway End Identifier Lights (REILS). In addition, the airfield lighting is distant from residential communities. The forest cover around Masons Creek to the north of the runway acts as a barrier to provide adequate protection from light emissions for the residential community along Fenimore Road.

4.13.2 Proposed Action

The Proposed Action would be limited to the addition and re-installation of typical airfield lighting. Runway and Taxiway lighting would be removed and relocated (see Figure 2.1-1). The new Runway and Taxiway light emissions will be similar to that of the existing lighting. Light emissions from the construction and operation of the Proposed Action would not be expected to cause or contribute to off-site annoyance or present a possible danger to persons living or driving in the vicinity of the Airport. No nighttime construction is planned; however, if nighttime construction were to occur, the light emissions would be temporary.

Construction activities associated with the Proposed Action would cause temporary visual changes onsite due to earth disturbance, equipment and worker activity; however, these will only be temporary. The Proposed Action would not change the visual environment of the area; therefore, the Proposed Action would not result in impacts to the visual environment.

4.13.3 No Action

Under the No Action Alternative, there would be no change to the airfield. Since there would be no new structures or lighting added to or removed from the landscape, there would be no change in the visual and aesthetic environment.

4.13.4 Impact Avoidance, Minimization and Mitigation

There will be no visual or light emission impacts as a result of the proposed project; therefore, no mitigation is proposed.

4.13.5 References

AECOM. 2015. South Jersey Regional Airport Master Plan Update: Prepared for the New Jersey Department of Transportation.

Order 5050.4B. 2006. National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions.

Order 1050.1E, Change 1. 2006. SUBJ: Environmental Impacts: Policies and Procedures. U.S. Department of Transportation Federal Aviation Administration.

4.14 Water Resources

This section describes existing conditions, Proposed Action impacts, and avoidance, minimization and mitigation measures for water resources in the study area; including surface waters, groundwater, wetlands, and floodplains. The study area is composed of Masons Creek, its tributaries and its associated wetlands and floodplain in and around the project area.

4.14.1 Existing Conditions

4.14.1.1 Surface Waters

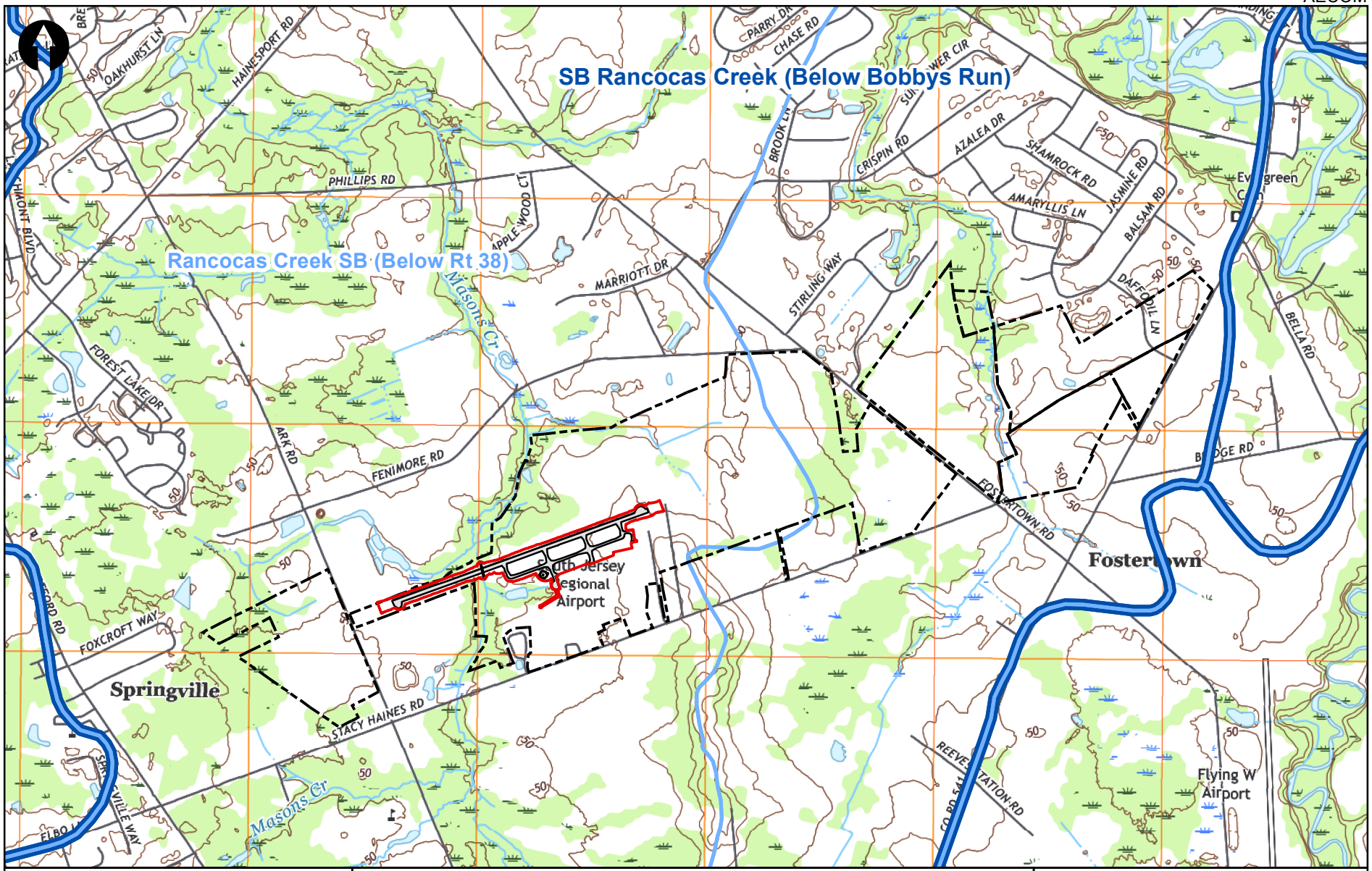
The project area is located within the Lower Delaware water region and within the Rancocas Creek Watershed Management Area (WMA). The Rancocas WMA is a large watershed in New Jersey that covers 360 square miles through approximately 33 municipalities. WMAs are comprised of drainage basins and watersheds which encompass multiple smaller watersheds. The project area falls within the South Branch Rancocas Creek (Below Route 38) subwatershed, which predominantly includes lands draining to Masons Creek, as well as areas draining to the tidal South Branch Rancocas Creek (Figure 4.14-1).

The airport property is located along Masons Creek, approximately two miles upstream of tidal waters. Masons Creek flows northerly through the airport property, and is carried beneath the runway via a culvert crossing consisting of five 48" CMPs. Several ponds and small unnamed tributaries associated with Masons Creek also occur on and near the airport property and adjacent to the project area as shown in Figure 4.14-2. The culvert crossing at the runway effectively serves as a control structure along Masons Creek, which is wider and somewhat impounded above the runway embankment, and much narrower, with a steeply incised channel below the runway. Beaver activity was noted along Masons Creek both upstream and downstream of the runway, as was a series of small man-made dams along an unnamed tributary north of the runway.

Masons Creek and its unnamed tributaries are classified pursuant to the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) as Category Two, general freshwater 2, non-trout (FW2-NT-C2) waterbodies. FW2 is a general surface water classification applied to waters that are not considered to have exceptional or unique ecological, recreational, or water supply significance. NT is a designation for surface waters that are generally not suitable for trout because of their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish species.

The Draft 2014 New Jersey Integrated Water Quality Monitoring and Assessment Report is the most recent report which provides information about New Jersey's water resources, its current water quality conditions related to attainment of various designated uses, and the causes and sources of water quality impairment. The 2014 Integrated Report indicates that water quality within the Rancocas Creek South Branch (Below Route 38) subwatershed is described as not supporting the general aquatic life, recreation, water supply or fish consumption designated uses. This subwatershed did not meet the public water supply designated use due to arsenic levels; did not meet the recreation designation due to Escherichia coli (E. coli) presence; did not meet the aquatic life designation due to dissolved oxygen and total phosphorus levels; and did not meet the fish consumption designation due to the presence of polychlorinated biphenyls (PCBs) in fish tissue.

The NJDEP is required to develop Total Maximum Daily Loads (TMDLs) for various waterways in accordance with Section 303(d) of the Clean Water Act (CWA) in order to address specific contaminants resulting in impairment of waters within the study area. TMDLs can briefly be defined as the amount of a pollutant that a given waterway can assimilate and still remain in compliance with the Surface Water Quality Standards (SWQS). TMDLs consider point source and non-point source pollution and are established through detailed



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Feet

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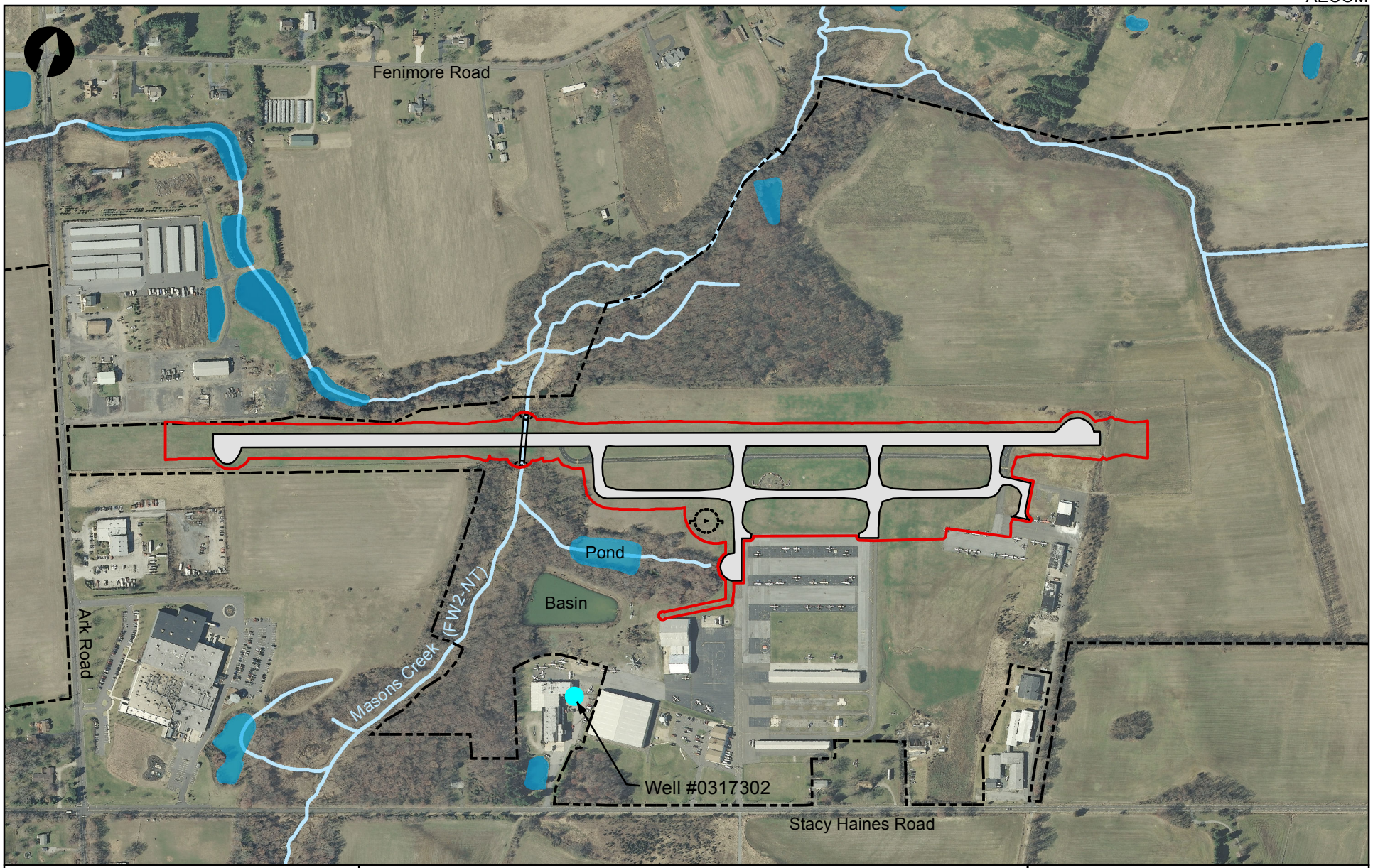
- Project Area
- Airport Property
- Sub-Watersheds
- Watersheds

Watershed Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and USGS Mount Holly US Topographic 7.5' quadrangle

Figure 4.14-1



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Feet

Legend

- Project Area
- Airport Property
- Waterbodies

Water Resources

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS

Figure 4.14-2

pollutant loading studies, which are performed by NJDEP and approved by the USEPA. TMDLs set forth a series of management strategies, which, once implemented, are expected to ultimately result in attainment of the water quality standards.

Based on the 2014 Draft 303d List of Water Quality Limited Waters with Sub-list 5 Subpart and Priority Ranking for TMDL Development, there are several TMDLs required for the Rancocas Creek South Branch (Below Route 38) subwatershed as summarized in Table 4.14-1.

TABLE 4.14-1
TMDLs Summary for Rancocas Creek South Branch (Below Route 38) Subwatershed

Parameter	Station Number	Cycle First Listed	Designated Use	Priority Ranking
Arsenic	01465915,19-ra-1s	2006	Water Supply	Low
Escherichia coli	01465915	2006	Recreation	Medium
Oxygen, Dissolved	01465915	2012	Aquatic Life	Medium
PCB in Fish Tissue	Delaware River tributaries to head of tide	2006	Fish Consumption	Low
Phosphorus (Total)	01465915	2002	Aquatic Life	Medium

Note: The head of tide, as mapped by NJDEP, is over two miles downstream of the airport for Masons Creek.

The 2014 draft integrated list mainly indicates development of these TMDLs as low and medium priority. Various sources may be considered as contributing to water quality conditions, including natural substrate conditions as well as agriculture, urban runoff and stormwater discharge sources.

The airport facility discharges stormwater to Masons Creek via overland flow as well as from an outfall from the existing stormwater management basin. The discharge of stormwater to Masons Creek is permitted under the New Jersey Pollutant Discharge Elimination System (NJPDES) rules (N.J.A.C. 7:14A). This permit is a regulatory mechanism set forth by the NJDEP to help ensure that the discharge will not harm the environment. The permit sets forth specific requirements for monitoring, reporting, record keeping, and facility operation and maintenance. Pursuant to the permit, various BMPs are set forth in the facility's Stormwater Pollution Prevention Plan (SPPP) to reduce or eliminate the exposure of stormwater to fuels, oils, greases and other substances in order to protect water quality within the receiving watercourse. As the airport does not perform deicing on the property, major water quality considerations for the airport center around the fuel/waste oil storage facilities and aircraft fueling operations as well as aircraft maintenance areas.

The fuel/waste oil storage facilities and aircraft fueling area are located approximately 200 to 300 feet from the proposed improvements (in front of Community Hangar #2 to #4). The storage area consists of a sloped concrete slab containing two, 12,000-gallon above ground storage tanks containing Jet-A fuel (Jet-A) and 100 low lead aviation gasoline (AVGAS). At the time of the assessment, a waste oil tank and several 55-gallon drums and some containers were observed in the fuel/waste oil storage area. All tanks appeared to have adequate secondary containment and the fuel storage area is sloped to direct spills to an inlet which leads to an oil interceptor. Treated effluent from the oil interceptor is discharged to the existing stormwater management basin, and ultimately to Masons Creek as permitted under the NJPDES permit.

4.14.1.2 Ground Water

The Proposed Action is located within the New Jersey Coastal Plain Aquifer System, which is an EPA-designated Sole Source Aquifer (SSA). According to the EPA, an SSA is an aquifer that supplies at least 50 percent of the drinking water for its service area, and where there are no reasonably available alternative drinking water sources should the aquifer become contaminated. The New Jersey Coastal Plain Aquifer System is part of the Northern Atlantic Coastal Plain Aquifer system in semi-consolidated sand. The wetland areas within and around the Proposed Action area contain a shallow groundwater table.

According to the Environmental Resource Inventory for the Township of Lumberton, the public non-community wells in Lumberton Township are either considered a transient non-community water system, that serves at least 25 people daily but the daily population changes each day, or a non-transient water system, that serves at least 25 of the same people daily at a minimum of six months per year.

The airport operates one public non-community well (Well ID #0317302) which provides for on-site drinking water. This well is located near the Air Victory Museum (See Figure 4.14-2) and has a depth of 350 feet. The next closest non-public supply wells are owned by Burlington County Special Services. They have three wells designated under Well ID #0317303, which are located on the border of Lumberton and Medford townships near the upstream tributary of Masons Creek. The three wells are all non-transient and have depths of 376, 367 and 379 feet. The closest NJ public water supply well serving Lumberton Township is owned by Mount Holly Water (Well ID #3104637) and is located in Mount Holly Township.

4.14.1.3 Wetlands

Wetlands serve many important functions including but not limited to minimizing flooding by absorbing and retaining water during storm events, improving water quality by filtering sediments and absorbing nutrients and pollutants; and providing habitat for many species of wildlife including Federal and state-listed endangered, threatened, and rare species. Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into Waters of the US, including wetlands as well as bodies of inland and coastal waters. The USEPA and the U.S. Army Corps of Engineers (USACE) have promulgated a number of regulations to implement the permitting program. While USEPA and USACE directly regulate Waters of the US in most states, in 1994, New Jersey was delegated regulatory authority from the USEPA for most non-tidal waters and wetlands in New Jersey, including those within the study area. NJDEP adopted the Freshwater Wetlands Protection Act Rules (N.J.A.C 7:7A) in 1988 and these rules and permits are administered by the NJDEP, Division of Land Use Regulation.

Wetlands within the project area were identified and delineated in April of 2017 in accordance with the three parameter approach (i.e., dominance of hydrophytic vegetation, presence of hydric soils and evidence of wetland hydrology) outlined in the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands. Prior to the delineation, standard background mapping sources were checked, which identified NJDEP-mapped wetlands as well as NRCS-mapped hydric soils on the site, the latter of which encompassed the majority of the project area.

It is notable that the wetland delineation followed NJDEP's generally accepted interpretation of the 1989 Federal Manual which considers areas having hydric soils as presumed wetlands, even if these areas lack current evidence of the remaining criteria. In New Jersey, these areas are typically referred to as modified agricultural wetlands, and are often agricultural in nature, but may include former agricultural lands which are presently covered by lawns or other areas of maintained vegetation. As determined via the 2017 delineation (See Appendix E), wetlands occur in the project area that are associated with Masons Creek and its unnamed

tributaries located to the north, south and east of the runway (Figure 4.14-3). Where hydric soils were observed, additional areas beyond the immediate stream corridors were delineated and mapped as wetlands.

As shown in Figure 4.14-3, the project area contains wetlands classified as Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Emergent (PEM), and Palustrine farmed (Pf) according to the U.S. Fish and Wildlife Service's Wetland Classification System (Cowardin et al., 1979). The palustrine wetland system includes all non-tidal wetlands dominated by trees, shrubs, and emergent vegetation, as well as certain wetlands that occur in tidal areas, depending on salinity levels. Forested and scrub-shrub wetlands are dominated by woody vegetation (generally greater than 20 feet tall in forested communities and less than 20 feet in scrub-shrub communities), while emergent wetlands are characterized by erect, rooted, herbaceous plants. Palustrine farmed wetlands usually contain crops; however, in the case of the study area, these modified agricultural wetlands predominantly contain maintained lawn vegetation.

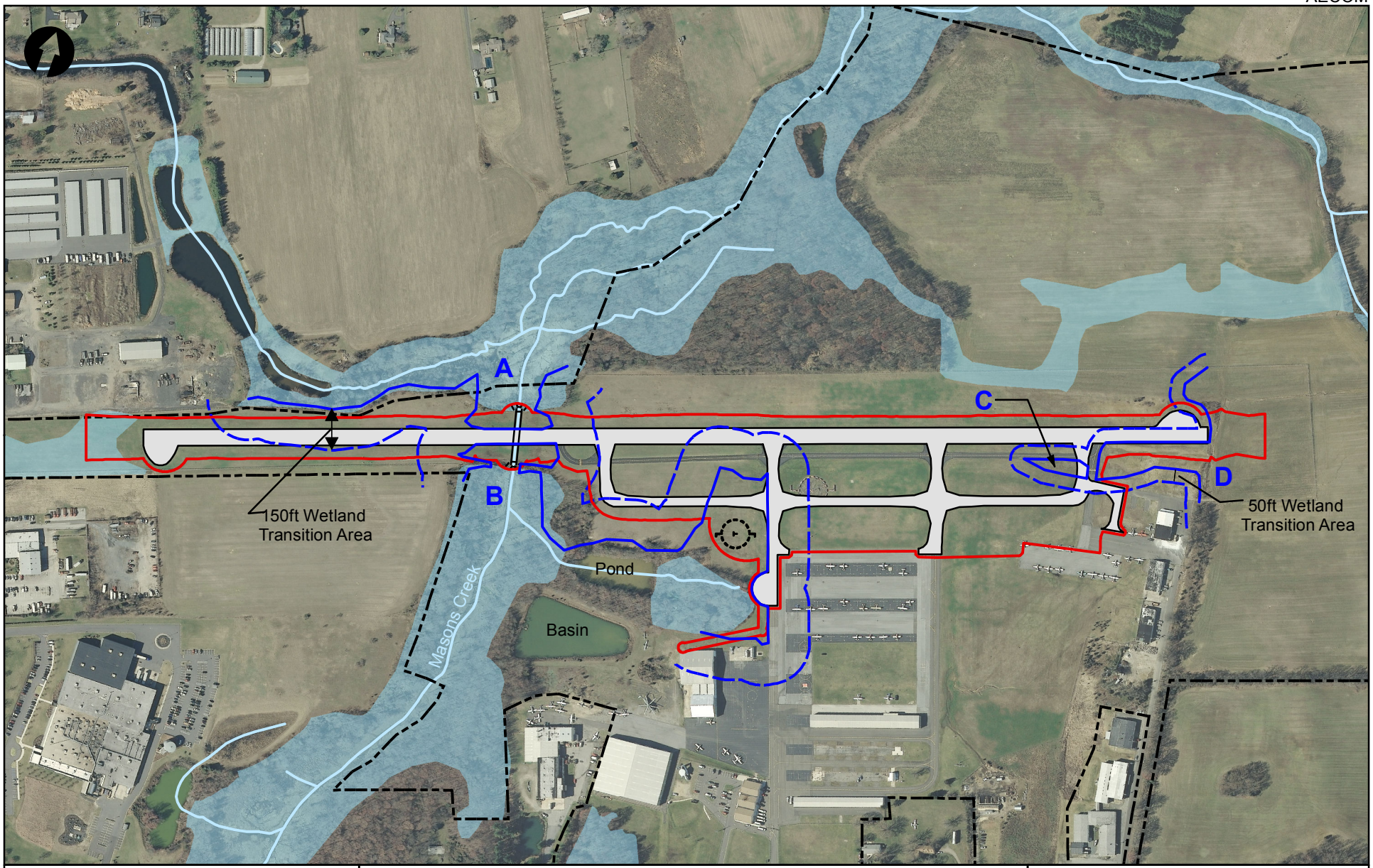
Dominant vegetation observed in the Palustrine Forested wetlands includes red maple, silver maple (Acer saccharinum), sweet gum, black willow (Salix nigra), pin oak (Quercus palustris), silky dogwood, musclewood (Carpinus caroliniana) and black gum (Nyssa sylvatica). Dominant shrubs and vines include southern arrowwood (Viburnum dentatum), spicebush (Lindera benzoin), winterberry (Ilex verticillata), Japanese honeysuckle and poison ivy. Herbaceous vegetation is dominated by skunk cabbage, Japanese stiltgrass (Microstegium vimineum), sensitive fern (Onoclea sensibilis) and cinnamon fern (Osmunda cinnamomea).

Palustrine Emergent wetland areas line the immediate banks of Masons Creek and are dominated by nearly monotypic stands of Japanese stiltgrass and/or reed canary grass with localized concentrations of common reed (Phragmites australis), green bulrush (Scirpus atrovirens), false nettle (Boehmeria cylindrical), skunk cabbage and occasional specimens of speckled alder. Another small area of Palustrine Emergent wetlands occurs in a ditch at the base of the Runway end 26 embankment, which is dominated by common reed, daylily (Hemerocallis fulva), bittercress (Cardamine hirsuta), dogbane (Apocynum cannabinum), soft rush (Juncus effusus), and Japanese honeysuckle.

The Palustrine Scrub-Shrub wetlands occur in relatively small areas between some of the emergent and forested habitats, and are dominated by black willow, speckled alder, arrowwood and silky dogwood, with a mix of herbaceous plants similar to the emergent wetlands.

The Palustrine farmed wetlands contain vegetation essentially the same as other, non-wetland lawn areas on the airport property and contain various lawn grasses, including tall fescue, ryegrass and Kentucky bluegrass, and a host of weeds including common dandelion, common plantain, English plantain, wild onion, common clover, chickweed and others.

Wetland functions and values within the project area were determined using the U.S. Army Corps of Engineers Highway Methodology Workbook Supplement as a guideline. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values and wetland values are based on human judgment of the worth, merit, quality, or importance attributed to its functions. Wetland functions associated with the project area wetlands include groundwater recharge/discharge, flood-flow alteration, fish and wildlife habitat, and production export due to the presence of prime farmland soils and soils of statewide importance in the project area wetlands. Values attributed to these wetlands include Uniqueness/Heritage due to the high potential for archaeological resources in the area, and Threatened or Endangered Species Habitat due to potential habitat for bog turtle and swamp pink.



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Feet

Legend

- Project Area
- Airport Property
- Delineated Wetlands
- Anticipated Wetland Transition Area
- NJDEP Wetlands

Wetlands Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and Wetland Delineation Survey April 2017

Figure 4.14-3

Wetlands associated with Masons Creek and its tributaries are not considered USEPA Priority Wetlands; however, based on historic occurrences of bog turtles (as described in Section 4.2.1.3) and the presence of suitable habitat, it is likely that these wetlands would be classified by the NJDEP as exceptional resource value, which requires a standard 150-foot freshwater wetland transition area, while remaining wetlands may be classified as intermediate resource value with a standard 50-foot wetland transition area. Wetland transition areas are protective buffers adjacent to wetlands established under the NJDEP Freshwater Wetlands Protection Act Rules. In addition, as discussed in Section 4.2.1.1, the small ponded area to the north of the runway is considered potential vernal habitat.

4.14.1.4 Floodplains

Floodplains are typically associated with, and are adjacent to, streams or lakes. In many instances, floodplain areas are roughly coterminous with freshwater wetlands and provide similar benefits, including water storage during floods, reducing peak discharges, and filtering floodwaters. Floodplain encroachments, such as artificial fill, reduce flood-carrying capacity and increase flooding in areas beyond the encroachment.

Historical encroachments within Masons Creek floodplain have already occurred as a result of the airport development, agriculture and the construction of public infrastructure, including roadways, utilities, and infrastructure. Despite these encroachments, the floodplains along study area waterways continue to serve important floodplain functions including floodwater attenuation, water quality maintenance, and wildlife habitat.

Floodplains are mapped along Masons Creek within the study area. According to the NJDEP Flood Hazard Area Control Act Rules at N.J.A.C 7:13, Masons Creek is a state-studied stream with an NJDEP-delineated floodway and NJ Flood Hazard Area where the runway crosses the creek. Additionally, the Federal Emergency Management Agency (FEMA) 2016 Preliminary Flood Insurance Rate Map indicates a 100-year floodplain along this watercourse as shown in Figure 4.14-4.

In addition to regulating construction in floodplains, the NJDEP Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) establish "riparian zones," which were enacted as an additional level of protection for near-watercourse vegetation, which plays an important role in water quality, stream channel stability, and flood storage. Masons Creek is expected to have a 50-foot wide riparian zone under the Flood Hazard Area Control Act Rules.

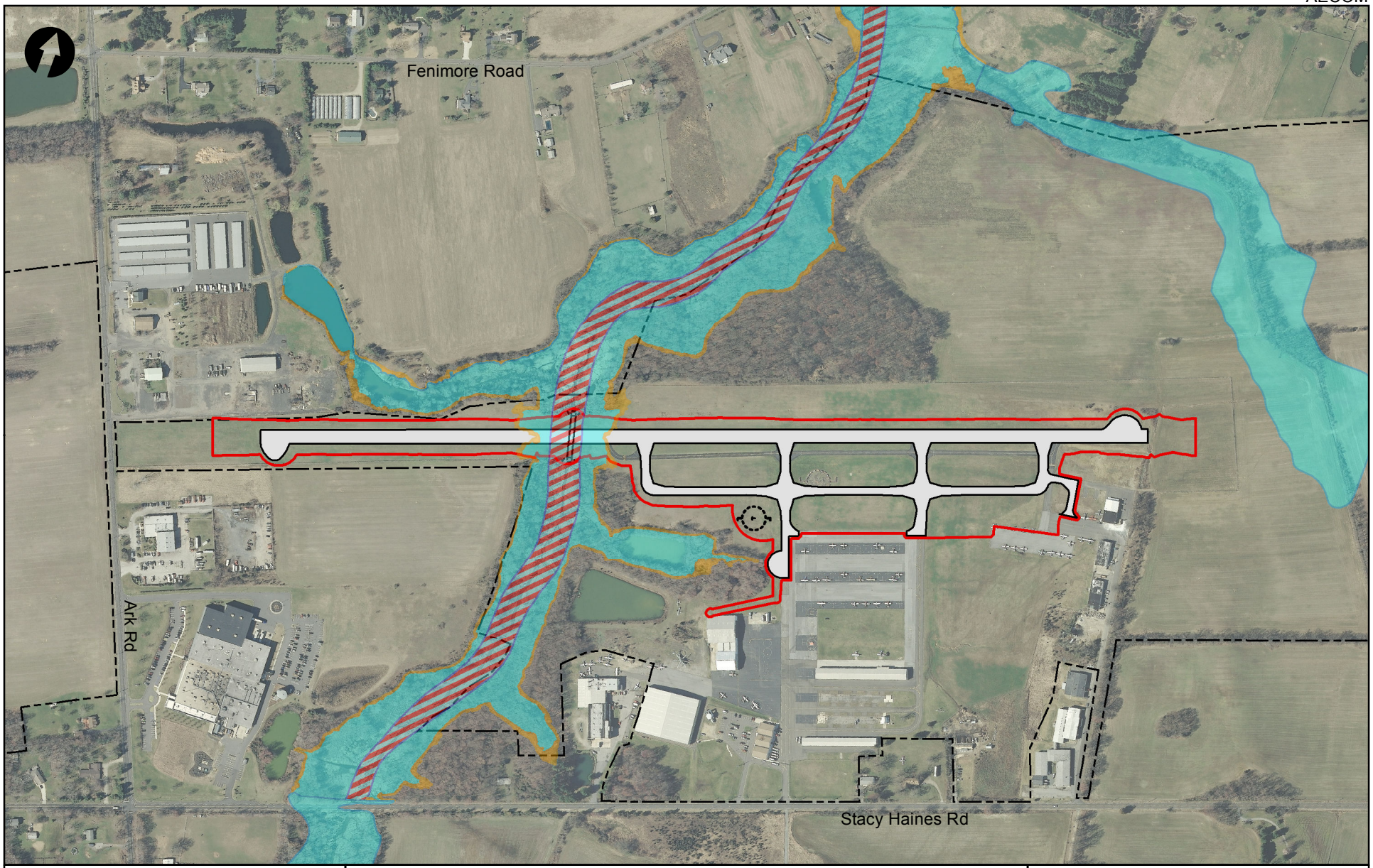
4.14.1.5 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Masons Creek, Rancocas Creek and the lower, tidal portion of the Delaware River where Rancocas Creek drains into are not listed in the Wild and Scenic River System or Nationwide River Inventory (NRI).

4.14.2 Proposed Action

4.14.2.1 Surface Waters and Water Quality

Based on hydraulic analysis (discussed in 4.14.1.4), the existing (five, 48" CMPs) culvert crossing of Masons Creek will be replaced with a three-sided rigid frame structure to accommodate peak flows of the NJ Flood Hazard Area design storm flood of Masons Creek beneath the runway. This work will impact wetlands, State open waters, and floodplains as discussed in 4.14.2.3 and 4.14.2.4 below.



600 0 600
Feet

Legend

- Project Area
- Airport Property
- FEMA 100-Year Floodplain
- FEMA 500-Year Floodplain
- FEMA Floodway

FEMA Floodplains

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: FEMA

Figure 4.14-4

The Proposed Action would also increase impervious surfaces by approximately 1.9 acres which has the potential to increase the amount of surface runoff during precipitation events and potentially increase the amount and type of contaminants entering area waterways, such as heavy metals, salts, organics, and nutrients.

During construction, vegetation clearing and earthwork would temporarily expose soil surfaces in the construction area, which has the potential to cause sedimentation of the nearby waterways. In addition, the potential exists for accidental discharges of oils, greases, and other petroleum products as a result of accidental spills from construction equipment.

As detailed in 4.14.4 below, the project will be designed in accordance with the NJDEP Stormwater Management Rules and would strive to achieve the highest water quality reasonably feasible for project-related impervious surfaces by meeting applicable design and performance standards to control erosion, encourage infiltration and groundwater recharge, and control stormwater runoff quantity impacts.

4.14.2.2 Groundwater

The approximate 1.9 acres of impervious surfaces associated with the Preferred Alternative would decrease the amount of pervious ground surface available for localized aquifer recharge. Although portions of the study area are considered important groundwater recharge areas, the increase in impervious surface is not considered adverse as the stormwater management design for the Proposed Action would meet applicable groundwater recharge requirements.

Due to the nature of the activities, the Proposed Action is not expected to result in contamination of the underlying aquifer and is not expected to result in temporary impacts to groundwater. As indicated above, and detailed in 4.14.4, the project will be designed in accordance with the NJDEP Stormwater Management Rules and would strive to maximize infiltration and achieve the highest water quality reasonably feasible for project-related impervious surfaces.

4.14.2.3 Wetlands

The Proposed Action would involve impacts to State open waters, freshwater wetlands, and wetland transition areas regulated by NJDEP under the Freshwater Wetlands Protection Act. The project impacts will occur in two general areas: (1) where re-grading of the RSA, widening and regrading of the runway, and relocation of the taxiway will result in filling modified agricultural wetlands, and (2) where the culvert crossing of Masons Creek will be modified to provide additional volume to pass flood flows beneath the runway. Approximate wetland impacts are summarized in Table 4.14-2.

The project will impact approximately 3.5 acres of wetlands, over 90 percent of which (+/- 3.3 acres) will involve filling, grading and/or paving of modified agricultural wetlands (presently maintained lawn areas) to meet the RSA grading requirements, improve the runway width and profile, and relocate the taxiway and segmented circle. Permanent impacts to State open waters, forested areas, and scrub shrub vegetation are primarily related to the proposed culvert crossing modifications and impact more sensitive habitat areas as discussed in Section 4.2. Temporary impacts are primarily related to constructability for the culvert installations and for drainage system installation and conduit trenching related to the proposed runway and taxiway lighting systems.

TABLE 4.14-2
Summary of Wetland Impacts

Wetland Type	Approximate Impact (Acres)
Permanent State open waters	0.019
Permanent forested	0.047
Permanent scrub shrub	0.032
Permanent modified agricultural (grass)	3.255
Temporary State open waters	0.011
Temporary scrub shrub	0.002
Temporary emergent	0.011
Temporary modified agricultural (grass)	0.159
Total	3.536

As the Proposed Action design advances, NJDOT may seek formal verification of the upper wetland boundary and the designation of resource value classifications through a Letter of Interpretation (LOI) application, and will ultimately obtain the necessary wetlands permit for the project from NJDEP.

The project will comply with Executive Order 11990, Protection of Wetlands via the issuance of an NJDEP freshwater wetlands permit. Mitigation for the wetland impacts will be negotiated with the NJDEP as part of the permit process.

4.14.2.4 Floodplains

As the proposed work will require raising the profile of the runway at the Masons Creek culvert crossing (through a delineated floodway and NJ Flood Hazard Area), a preliminary analysis was performed on the existing culverts using the HY-8 and Culvert Master programs to estimate the headwater elevations for 10-year, 50-year, and 100-year storm frequencies. The analysis indicated that the existing system of five, 48" CMPs can accommodate peak flows for the 100-year storm event; however, preliminary analysis indicates that a larger opening would accommodate peak flows of the NJ Flood Hazard Area design storm without raising the upstream water surface elevation. Based on preliminary hydraulic analysis, it appears that replacing the existing culvert crossing with a three-sided rigid frame structure would be the most prudent option to ameliorate any flooding conditions (upstream or downstream) which may result from raising the runway profile and re-grading the RSA.

The Proposed Action is subject to the requirements of Executive Order 11988, Floodplain Management. The alternatives considered under the 2015 Master Plan appropriately considered impacts to floodplains, and therefore satisfies the alternatives analysis requirements of Executive Order 11988. In addition, the project will comply with the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) which is more restrictive than Executive Order 11988.

The Proposed Action would result in approximately 0.15 acres of permanent impacts to woody riparian zone vegetation associated with Masons Creek as a result of the culvert replacement and improving the runway profile. These impacts are considered permanent as woody vegetation cannot be reestablished due to FAA requirements for the OFA.

To address impacts to floodplains and riparian zones, the NJDOT will apply for and obtain an NJDEP Flood Hazard Area Individual Permit prior to construction.

4.14.2.5 Wild and Scenic Rivers

As indicated above, Masons Creek, Rancocas Creek and the lower, tidal Delaware River are not listed in the Wild and Scenic River System or Nationwide River Inventory (NRI); therefore, the Proposed Action would not affect any river listed in the Wild and Scenic River System.

4.14.3 No Action

The No Action alternative will have no impacts on the existing water resources in and around the project area.

4.14.4 Impact Avoidance, Minimization and Mitigation

NJDOT has worked to avoid or minimize long-term impacts to water resources including surface and ground water quality, wetlands, floodplains and riparian zones in several ways:

- Limit taxiway length to avoid a new crossing of Masons Creek which would require in-water impacts, wetland and riparian zone impacts, as well as permanent in-water structures.
- Minimize disturbance to sensitive resources along Masons Creek by seeking modifications to the design standards in order to avoid clearing trees and shrubs within the entire Runway Object Free Area.
- Minimize the area of construction disturbance to the minimum necessary to effectively meet the Purpose and Need.
- Provide water quality and stormwater management enhancements for the project. The proposed stormwater management facilities are expected to include vegetative filtration for storm water sheet flow draining off the runway and taxiways; grass swale treatment where there is 200' of shallow concentrated flow upstream of each inlet; and a manhole-style hydrodynamic separation-type manufactured treatment device. Best management practices (BMPs) and Low Impact Design techniques will be incorporated to the fullest extent practicable and designed in accordance with the NJDEP Stormwater Management Rules and the New Jersey Stormwater Best Management Practices Manual. In order to minimize any hydrologic impacts, the stormwater design will be closely coordinated with NJDOT, NJDEP and USFWS to attenuate peak flows and will seek to mimic the pre-development 2 and 10-year hydrographs.
- Minimize in-water construction to the fullest extent possible through the use of project-specific staging and “pump around” operations to be developed in coordination with NJDEP DLUR and USFWS during the permitting phase.
- Require the Contractor to implement and maintain controls during construction to protect water quality from sedimentation and exposure to acid-producing soils, which are likely to occur in the project area. Excavations will be monitored for the presence of acid-producing soils during construction. If such soils are encountered, mitigation measures will be implemented in accordance with NJDEP and NJDOT requirements.
- Apply standard soil erosion and sediment control measures including heavy duty silt fence, hay bales, inlet filters and a stabilized construction entrance.

- Require the Contractor to implement and maintain controls during construction to protect waterways from sedimentation and accidental spills of construction materials and debris that could have long-term effects on water quality.
- Implement a spill prevention and cleanup plan during construction to address potential for discharges of petroleum, grease or other fluids from construction equipment. This plan will require inspections of construction equipment at the start of each work day to check for evidence of leaks; parking equipment away from wetlands, waterways, and storm drains when not in use; conducting equipment fueling operations away from wetlands, waterways, and storm drains; and maintaining a spill kit with an adequate supply of sorbent materials, booms, etc.
- Prohibit construction staging activities (including the storage of vehicles, equipment, or materials) in or near environmentally sensitive areas that would not otherwise be impacted by the project.
- Specify other standard environmental controls, including the use of concrete washout stations to be located away from area waterways and wetlands.
- Abide by any NJDEP requirements to obtain permits, abide by permit conditions and provide mitigation as determined through the Division of Land Use Regulation (DLUR) permit application process.
- Comply with Executive Order 11990, Protection of Wetlands; Executive Order 11988, Floodplain Management; N.J.A.C. 7:9C Ground Water Quality Standards; N.J.A.C. 7:9B Surface Water Quality Standards; N.J.A.C. 7:7A Freshwater Wetlands Protection Act Rules; N.J.A.C. 7:13 Flood Hazard Area Control Act Rules; and the Clean Water Act 33 U.S.C. §1251 et seq.

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4.15 Cumulative Impacts

4.15.1 Introduction and Methodology

This chapter identifies and describes the potential for the Proposed Action to cause or contribute to cumulative effects on the environment. NEPA regulations (40 CFR 1508) define cumulative impacts as "the impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency, Federal or non-Federal or person undertakes such other actions." This cumulative impact assessment has been prepared in accordance with FAA Order 1050.1F, DOT Order 5610.1C and January 1997 CEQ guidance and includes:

- Identification of resources of interest
- Establishment of geographic and temporal boundaries
- Determining past, present, and reasonably foreseeable future projects to be assessed as part of the cumulative effects analyses
- Assessment of cumulative impacts to resources of interest within the defined geographic and temporal boundaries and a determination of significance for each resource

The primary data sources included land use / land cover data, local land use plans, and information on planned development projects. The analysis varied per resource and employed a combination of methodologies to assess and quantify indirect and cumulative effects. These techniques included trend analysis and mapping analysis to assess patterns of past, existing, and future land use and the effects of development on resources of interest.

4.15.2 Resources of Interest

Resources and impact considerations selected for analysis include (1) those that would be affected directly by the Proposed Action, (2) those that would be affected by any potential project-related indirect development, and/or (3) those that may be susceptible to measurable effects from foreseeable projects over time. These resources and impact categories include:

- Built Environment
  - Neighborhoods, Community Character and Community Facilities
  - Historic and Archeological Resources
- Natural Environment
  - Water Resources
  - Habitat and Wildlife

Resources that are not assessed in this indirect and cumulative effects analysis are those that cannot reasonably be assessed on a sub-regional cumulative level, such as air quality and noise, or resources that would not be affected directly by the Proposed Action or are not particularly susceptible to cumulative effects from foreseeable projects within the study area, such as environmental justice populations and Section 4(f) resources.

4.15.3 Geographic and Temporal Boundaries

Potential secondary effects associated with airport projects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on the natural and social environment in and around the airport site, whereas cumulative impacts should be considered in a larger surrounding area in order to encompass resources potentially affected by multiple projects considered together.

Upon review of various mapped geographic boundaries (i.e., municipal and census tracts and other divisions, watersheds and subwatershed boundaries, etc.) and their relationship to the airport site, it was determined that the most reasonable and inclusive geographic area for analysis of cumulative impacts would consist of the area associated with the Census Block Group (Census Tract 7031.02, Block Group 1) as well as the subwatershed area draining into Masons Creek and it's receiving watercourse, the South Branch Rancocas Creek. This Cumulative Impact Study Area (Figure 4.15-1) encompasses approximately 16 square miles and includes portions of Lumberton Township, Hainesport Township, Mount Laurel Township and Medford Township.

For the purposes of this analysis, the past timeframe is 2004 to coincide with NJDOT's purchase of the airport, and future timeframe is 2031 to match the FAA-accepted aviation demand forecast. Analysis of cumulative impacts during this timeframe will vary per resource consideration.

4.15.4 Past, Present, and Reasonably Foreseeable Future Actions

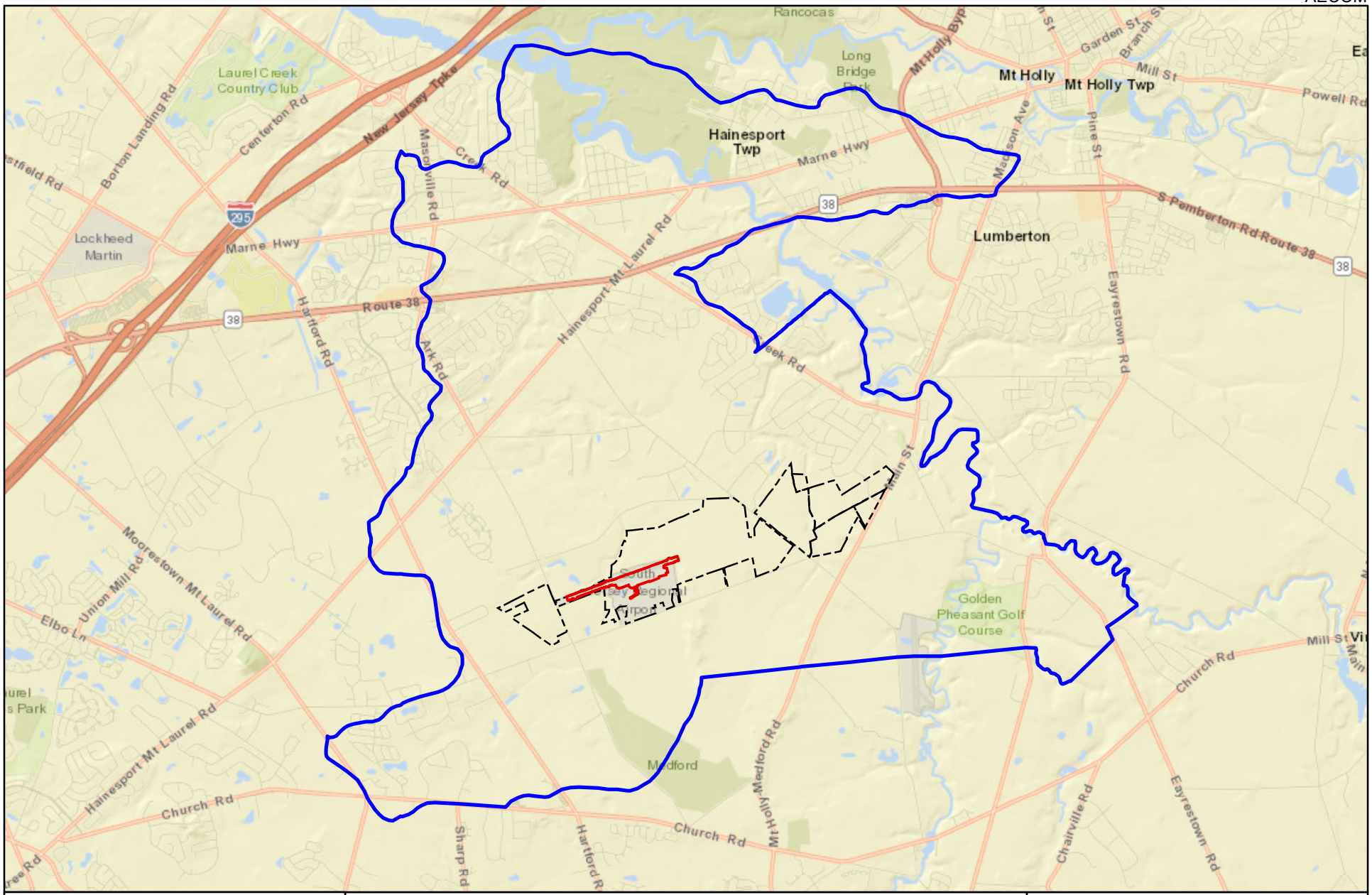
In addition to non-specific regional growth in the Cumulative Effects Study Area, milestone plans and projects identified for the cumulative impact analysis include:

Purchase of VAY by the State of New Jersey (2004): Airside facilities including Runway 08/26 (3,911' long by 50' wide), Taxiways A, B, C and D, and runway and taxiway lighting systems were essentially the same as the present day facilities; however, at that time there were four hangars to the east of the terminal area including Hangars A, B, C and D. The existing detention basin, community hangars, Air Victory Museum, main terminal area and eastern industrial buildings also existed essentially as they do today.

Demolition of Hangars B and C (2007-2008): A minor on-airport project with no impacts to natural resources or socioeconomic conditions. Land use at the facility remains essentially unchanged.

Airport Master Plan Update and ALP (2013-2015): Supplementing the 1997 Approved Airport Master Plan and ALP, these planning activities examined and updated the airport activity forecast for the current 20-year planning period, evaluated current and future facility requirements for both demand-driven development and conformance with FAA design standards, and provided a recommended development plan, implementation/phasing plan and financial plan based on the facility requirements.

The results of these activities were detailed in a 2013 draft version of the Master Plan. Additional work on the ALP during 2015 triggered minor changes to the inventory and phasing sections which were presented in the current approved Master Plan and ALP (2015). Both the 2013 and 2015 Airport Master Plan updates determined that improving the safety of the airfield by ensuring compliance with the latest FAA safety design standards should be a key focus. The majority of the recommended airport development and implementation projects are based on satisfying the FAA design standards and increasing the safety and efficiency of the Airport. The runway and taxiway improvements which are the focus of this EA are required to satisfy FAA design standards as identified through an evaluation of facility requirements and alternatives analysis.



5,000 2,500 0 5,000

Feet

Legend

- Project Area
- Airport Property
- Cumulative Impact Study Area

Cumulative Impacts

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 08-26
Lumberton Township
Burlington County, New Jersey

Figure 4.15-1

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

The FAA's 2012 review of the Aviation Demand Forecast and Capacity Analysis for the Airport Master Plan update concluded with approval of the airport activity forecast of estimated based aircraft, and estimated aircraft operations through 2031, and recognized that previous approved planning documents have shown a proposed layout for Airport Reference Code B-II. A conservative assumption, for the purposes of this analysis, is that airport activity to support a B-II Airport Reference Code will be met, and that the NJDOT's Ultimate-Future Phase, as shown in the ALP can be considered a cumulative effect.

Given the required phasing for full implementation, it should be highlighted that design and construction of each phase would be considered a separate Federal action and each project will require its own technical environmental studies, assessment of impacts and mitigation under NEPA in addition to any required environmental permits and related mitigation measures, environmental commitments, and best management practices.

Obstruction Removal of 20:1 Penetrations for Runway 26 and 08 Ends (Anticipated 2018): As directed by FAA requirements, the NJDOT is undertaking this project to remove potential airspace obstructions at the airport in order to maintain the necessary flight envelope and enhance safety at the airport. Obstructions will be removed within the Straight-in Plus Circling 20:1 surfaces for runway ends 08 and 26, and within the adjacent 20:1 surface used for Very High Frequency Omnidirectional Range (VOR) approaches beyond runway end 26. The total area of vegetation clearing within the 20:1 surfaces measures approximately 16 acres to the east and west of the runway, a portion of which occur within regulated freshwater wetlands, transition areas and riparian zones.

This work was the subject of a Short Form EA and the FAA issued a Finding of No Significant Impact in 2016. At this time, NJDEP freshwater wetlands and flood hazard area permit applications are under preparation.

4.15.5 Cumulative Effects Assessment

As indicated above, the cumulative impacts temporal scale goes back to 2004 when NJDOT purchased the airport. In order to discern changing development patterns and land uses from the past time frame (i.e., 2004 to present), a comparison of 2002 and 2012 NJDEP Land Use Land Cover data was performed within the Cumulative Impacts Study Area. This ten year comparison could be considered the best approximation of land use changes during the past timeframe using readily available data.

Table 4.15-1: Comparison of Cumulative Effects Study Area Land Use 2002-2012

Land Use	Acres 2002	% of Study Area 2002	Acres 2012	% of Study Area 2012	Difference (Acres)	% Change 2002-2012
Urban	3,292	31.4%	4,580	43.6%	1,288	39.1
Forest	1,519	14.5%	1,295	12.3%	-224	-14.7
Wetlands	2,337	22.3%	2,183	20.8%	-154	-6.6
Agriculture	3,056	29.1%	2,190	20.9%	-866	-28.3
Barren Land	114	1.1%	45	0.4%	-69	-60.5
Water	178	1.7%	204	1.9%	26	14.6

Source: NJDEP Land Use/Land Cover GIS Data 2002 and 2012
Notes: 1. Gains in water, and portion of wetland losses are attributed to improved mapping techniques
2. Columns may not add due to rounding

As shown in Table 4.15-1 above, the Cumulative Effects Study Area lost a sizeable 28 percent of its agricultural land base, and experienced an approximate 15 percent reduction in forestland and roughly 6 percent loss in wetlands from 2002-2012. Based on the corresponding 39 percent gain in urban area, it is clear that the conversion of these socioeconomic and natural resources over this ten year period represents an important change in the economic structure and rural character of the Cumulative Impact Study Area, as well as an overall decline in natural resources and habitat, and expected cumulative impacts to water quality and stream corridor conditions. It is expected that this change is the result of declines in agriculture profitability coupled with the housing boom and skyrocketing land prices during the first half of this timeframe. In the absence of the Great Recession of 2008, it is expected that this suburban conversion and analogous environmental degradation would have been more pronounced.

On a more local scale, implementation of the Ultimate-Future Phase is not expected to be the sole or primary driver of change in the project area; however, assuming airport activity meets the requirements for a B-II designation over the course of the cumulative effects timeframe, it is reasonable to expect that the surrounding area would experience additional development and redevelopment, some of which may be related to, or encouraged by improvements at the airport. Although this growth would also be spurred by local and regional economic and development trends, and will depend on future comprehensive land use plans and zoning designations, future development under the Proposed Action could be somewhat greater than under the No Action Alternative, and could generate indirect effects on the built and natural environment as described below.

Built environment – Due to zoning restrictions associated with the State-mandated ASZ, the airport has historically, and will continue to contribute to the rural-suburban nature of the surrounding area via restriction of incompatible land uses. The Proposed Action as well as the Ultimate-Future Phase (as shown in the ALP) could further contribute to social and economic influences that transform the study area over time. The effects of indirect development could include visual and related changes to the existing rural-suburban character of the area, a potential reduction in agricultural activities in the immediate area, and associated changes in economic and business conditions. Any potential new airport-related development could also increase the demand for public infrastructure, including transportation and utility infrastructure; however, NJDOT anticipates that local governments will plan and program capital improvements (including maintenance, expansion, and new facilities) to public facilities and services to accommodate any increasing demand.

In addition, the cumulative effects study area includes numerous cultural resources, including historic agricultural districts and numerous Pre-Contact Native American archaeological sites. The archaeology sites may collectively be considered an archaeological district comprised of a series of sites distributed across the landscape. Considered as a whole, the sites may have greater significance than when considered individually. Should reasonably foreseeable future actions impact any of the sites, they may affect the ability of the aggregate of all of the sites to convey information that is important in prehistory, and therefore be considered eligible for protection under Section 106.

The NJDOT is committed to preservation of the identified archeological site on the property and will take various measures to protect archaeological resources on the airport site when conducting future maintenance and capital improvement projects at the airport (as detailed in Section 4.8.4); however, it should be noted that the potential for cumulative impacts exists, primarily related to actions of others within the Masons Creek drainage. While Federally funded, permitted or authorized actions would have to consider, avoid and/or minimize impacts on historic and archaeological resources, effects on these resources as a result of other past,

present and reasonably foreseeable projects, particularly private development projects, have and potentially will continue to occur. Existing federal and state regulations and guidelines are in place to provide protection to cultural resources; however, it is recognized that not all projects are subject to regulation.

Overall, the cumulative impacts of the Proposed Action on the built environment (including neighborhoods and community facilities, parks and recreational facilities, and cultural resources), in the context of other past, present and reasonably foreseeable projects, would be geographically and temporally limited and would not be considered adverse or significant.

Natural environment – As described in Section 4.2 and Section 4.14 above, the impact of the Proposed Action upon natural resources in the Cumulative Effects Study Area would be localized. Freshwater wetlands would see the greatest impact as the Proposed Action would result in grading and disturbance of approximately 3.5 acres, and the Proposed Action would increase impervious surface areas by approximately 1.9 acres. As the Proposed Action design advances and in consultation with NJDEP, NJDOT will continue to examine ways to avoid or minimize natural environment effects and will mitigate project-related impacts as required by federal and state laws. Although the Proposed Action would increase impervious surfaces and would involve work within floodplains, it will provide water control structures and stormwater management facilities designed in accordance with NJDEP requirements and regulations to control flood flows and the rate and quality of water leaving the Proposed Action sites with the goal of having no adverse effect on receiving water bodies.

The potential impacts to natural resources from indirect and cumulative development over the course of the cumulative effects timeframe include increased stormwater runoff and water quality effects resulting from an increase in impervious surfaces, and the loss or degradation of forests, wetlands, riparian areas, and wildlife habitat as undeveloped land is developed. It is anticipated that federal and state water quality and other regulations would address and prevent such effects. Furthermore, where redevelopment activities occur on already-developed land, such as various lots contiguous to the airport, the impacts on the natural environment would be even less.

Additional past, present, and foreseeable future development in the cumulative effects study area has and will continue to have potential impacts upon natural resources: conversion of forests, agricultural and undeveloped land, and water resources including wetlands and floodplains. For future development by NJDOT and by others, federal, state, and local laws and regulations will continue to guide this development to prevent loss and/or degradation of natural resources.

5.0 Agency Coordination

During preparation of this EA, NJDOT consulted with the following agencies:

- Federal Aviation Administration
- U.S. Fish and Wildlife Service
- New Jersey Department of Environmental Protection
- New Jersey State Historic Preservation Office
- Township of Lumberton

Copies of coordination letters and other documentation have been included in Appendix A.

6.0 Public Involvement and EA Review Comments

No adverse impacts were identified which could not be satisfactorily managed with seasonal restrictions on work in certain habitats or best management practices, and the project was not expected to be controversial on environmental grounds; therefore, no public meeting was held. The Draft EA was made available for public review and comment for 30 days from April 24, 2018 to May 23, 2018 with notice of availability being published in the Courier Post, the primary local newspaper in the vicinity of the airport (See Appendix F). In addition, the following agencies were sent letters notifying them of availability of the Draft EA document for review and comment:

- USEPA, Clean Air and Sustainability Division, Sustainability and Multimedia Programs Branch, Environmental Review Section
- US Fish and Wildlife Service
- DVRPC, Office of Freight and Aviation Planning
- NJDEP, Office of Permit Coordination and Environmental Review
- Lumberton Township Mayor and Township Clerk
- Burlington County Planning Board
- Burlington County Engineer

No public comments were received; however, comment letters were received from the above-listed USEPA and NJDEP offices (See Appendix F).

The USEPA indicated that the EA document demonstrated a finding of no significant impacts, but recommended that in the future the applicant should prepare both the EA and wetlands/floodplain permits concurrently so that any required mitigation can be discussed and available for public review during the comment period. This comment is acknowledged; however, it is noted that this is not always possible given the availability of funds and tiered project delivery process of initial planning and NEPA documentation, followed by detailed project design and permitting.

The NJDEP Office of Permit Coordination and Environmental Review comment letter included natural resources (NJDFW), Land Use permitting and/mitigation, mobile sources (i.e., air quality) and Stormwater Management elements.

The NJDFW indicated that, based on the documents reviewed and scope of work, the proposed project is anticipated to have little to no effect on faunal threatened/endangered species or designated critical habitat. Based on the presumed presence of upland sandpiper, the NJDFW requires a timing restriction from April 1 to August 15 for any impact to taller grassland areas which would be considered nesting habitat for the species. In addition, the NJDFW requires a timing restriction from April 1 to June 30 on any in-water and/or sediment generating activities in order to protect warm-water fish and pickerel. NJDFW further indicated that a general timing restriction on trimming or removal of trees from April 1 to August 31 is recommended to protect nesting birds covered under the NJ Endangered & Nongame Species Conservation Act. Finally, NJDFW noted the ongoing consultation with USFWS and memorialized their support for all comments and conditions from the USFWS. The required and recommended timing restrictions are acknowledged, and will be incorporated as environmental commitments.

The mobile source comments identified recommendations and requirements related to emissions from construction equipment including: (1) compliance with the three minute idling limit pursuant to the NJ Air Pollution Control Regulations (N.J.A.C. 7:27-14 and N.J.A.C. 7:27-15) and posting “No Idling” signs during

construction, (2) use of equipment having engines that meet the USEPA Tier 4 non-road emission standards, or the best available emission control technology that is technologically feasible for that application and is verified by the USEPA or the California Air Resources Board as a diesel emission control strategy for reducing particulate matter and/or NOx emissions, and (3) use of designated truck routes for on-road diesel vehicles hauling materials or traveling to and from the construction site which are designed to minimize impacts on residential areas and sensitive receptors such as hospitals, schools, daycare facilities, senior citizen housing, and convalescent facilities. In order to minimize potential impacts to air quality, NJDOT will abide by applicable NJDEP recommendations regarding mobile source emissions during the construction period.

The NJDEP-DLUR verified the permit requirements (discussed in Section 7.0 below), including an individual freshwater wetlands permit and individual flood hazard area permit, and noted that mitigation will be required for impacts to freshwater wetlands. The DLUR indicated that the bog turtle and swamp pink survey reports should be included in any permit applications, and recommended a pre-application meeting be held prior to final design to discuss permitting requirements and impact minimization measures.

Regarding stormwater management, the NJDEP related the requirement for coverage under the Stormwater construction general permit (5G3) for projects disturbing one acre or more of land, as well as the requirement to obtain certification of the soil erosion and sediment control plan, both of which are further discussed in Section 7.0 below.

7.0 Permits and Approvals Required

The Proposed Action was evaluated to determine required environmental permits and approvals, which would be applied for during the final design phase. Anticipated permits and approvals for the Proposed Action include:

NJDEP Freshwater Wetlands Individual Permit

As indicated in Section 4.2, the Proposed Action would result in permanent impacts to approximately 3.5 acres of freshwater wetlands and State open waters; therefore, the Proposed Action will require an Individual Freshwater Wetlands Permit under the NJDEP's Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A). This regulatory program also represents state assumption of the authority to enforce federal requirements under Section 404 of the Clean Water Act.

The Individual Permit will require documentation that the Proposed Action has no practicable alternatives that would have lesser impacts, or would not involve wetlands. In addition, NJDOT would provide mitigation which will be negotiated with NJDEP during the permitting phase.

Water Quality Certificate

The Freshwater Wetlands Individual Permit review by NJDEP would include a simultaneous review for the issuance of the water quality certificate required pursuant to the Federal Water Pollution Control Act at 33 U.S.C. § 1341.

NJDEP Flood Hazard Area Individual Permit

The Proposed Action will require construction within the Masons Creek floodway, flood hazard area and riparian zone, which are regulated under the NJDEP Flood Hazard Area Control Act Rules. A Flood Hazard Area Individual Permit will be required and mitigation will be provided for impacts to riparian zone vegetation which will be negotiated with NJDEP during the permitting phase.

Soil Erosion and Sediment Control Plan Certification

The project will disturb more than 5,000 square feet of earth and thus will require a Soil Erosion and Sediment Control Plan Certification. The Department of Transportation will certify to the Burlington Soil Conservation District that the appropriate standards are included in the project, and will be used during construction to comply with the intent of the Soil Erosion and Sediment Control Act to protect the environment from the effects of soil erosion and sedimentation.

NJDEP Construction Activity Stormwater General Permit

A Stormwater General Permit is required pursuant to the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules (N.J.A.C. 7:14A) and authorizes stormwater discharge to surface waters from construction activities that disturb one acre or more of land. Request for Authorization (RFA) under this General Permit will be submitted to the NJDEP.

The anticipated permits and approvals and the estimated agency review durations for the Proposed Action are summarized in Table 7.0-1 below:

Table 7.0-1: Summary of Applicable Permits and Approvals

Applicable Permit or Approval	Regulatory or Coordinating Agencies	Estimated Agency Review Duration
NJDEP Freshwater Wetlands Individual Permit	New Jersey Department of Environmental Protection	90-180 days
NJDEP Flood Hazard Area Individual Permit	New Jersey Department of Environmental Protection	90 days
Water Quality Certificate	New Jersey Department of Environmental Protection	90 days
Soil Erosion and Sediment Control Plan Certification	NJDOT (self-certifying)	30 days
NJDEP Construction Activity Stormwater General Permit	New Jersey Department of Environmental Protection	30 days

Source: Federal and State Regulations, 2018

8.0 List of Preparers

Federal Aviation Administration:

Edward Gabsewics, Environmental Specialist
Susan McDonald, Environmental Specialist

New Jersey Department of Transportation:

Ashwin (Max) Patel, Acting Manager, Division of Aeronautics
Gerard A. Leipfinger, Project Manager, Aeronautical Operations Specialist
Paula Scelsi, Environmental Specialist 4
Lauralee Rappleye, Acting Manager/Archeologist
James Sweet, Environmental Specialist 4
Raymond Souweha, Environmental Specialist 3

AECOM:

George Sholy, Project Manager
Timothy Hand, NEPA Document Reviewer
Anthony J. Velazquez, NEPA Document Manager
Rachel Nangle, Environmental Planner
Max Ojserkis, Environmental Planner
Kelly McCurry, Environmental Planner
Bridger Thompson, Certified Bog Turtle Surveyor
Bryan Oscarson, Airport Planner
Karen Kramkowski, Civil Project Engineer
Robert Schwade, Hydraulics and Hydrology Reviewer
Jim Guan, Hydraulics and Hydrology Specialist
Fang Yang, Air Quality and Noise Specialist
Joel Dworsky, M.A., RPA., Archaeologist
Benjamin Buckley, Architectural Historian

NV5:

Rick Porter, Supervisor/Historian
Jean Howson, Principal Archaeologist/Cultural Resources Specialist
Len Bianchi, Principal Archaeologist/ Field and Laboratory Director

Appendix A
Agency Coordination

HPO Project No.15-1796-5
HPO-E2018-045

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NATURAL & HISTORIC RESOURCES
HISTORIC PRESERVATION OFFICE
MAIL CODE 501-04B
P.O. BOX 420
TRENTON, NJ 08625-0420
TEL: # 609-984-0176 FAX: # 609-984-0578

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Acting Commissioner

May 3, 2018

Ms. Lauralee Rappleye, Acting Manager
New Jersey Department of Transportation
Bureau of Environmental Program Resources
1035 Parkway Avenue
P.O. Box 600
Trenton, NJ 08625-0600

Dear Ms. Rappleye:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published in the Federal Register on December 12, 2000 (65 FR 77725-77739) and amended on July 6, 2004 (69 FR 40553-40555), I am providing consultation comments on the following proposed undertaking:

Burlington County, Lumberton Township
South Jersey Regional Airport
Runway 8-26 Widening and Ancillary Improvements
Draft Phase I Archaeological Survey
Federal Highway Administration

Thank you for providing the Historic Preservation Office (HPO) with the opportunity to review and comment on the potential for the above-referenced undertaking to affect historic properties pursuant to Section 106 of the National Historic Preservation Act, as amended.

These comments are in response to the following draft archaeological survey report received at the HPO on April 5, 2018:

Howson, Jean E. and Leonard G. Bianchi
February 2018 *(Draft) Cultural Resource Survey, Widening of Runway 8-26 and Ancillary Improvements, Township of Lumberton Burlington County, New Jersey*. Prepared for New Jersey Department of Transportation. Prepared by NV5, Parsippany, NJ.

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800.4 Identifying Historic Properties

Upon review of the above referenced draft terminal Phase I archaeological survey report, the HPO concurs that the Phase I survey including five three-foot square test units for better understanding site soil stratigraphy and integrity has identified an intact probably late Archaic period locus within the southern limit of site 28-Bu-62.

The HPO concurs avoidance during construction through fencing (Figure 6.1), signage, and referenced in project documents is appropriate. If project plans change and site 28-Bu-62 cannot be avoided, Phase II archaeological survey will be necessary to evaluate the site for inclusion on the National Register of Historic Places. Any Phase II survey will require at a minimum a one-percent sample (or approximately 33 test units for this approximately 35,000 square foot site).

Additional Comments

Thank you for providing the opportunity to review and comment on the submitted documentation. The HPO looks forward to a copy of the final report for our records. It is interesting to note that an isolated mid-18th century Masonic cufflink was found along Masons Creek and if there is any relationship with the creek's name. Please do not hesitate to contact Vincent Maresca of my staff at (609) 633-2395 or vincent.maresca@dep.nj.gov with questions regarding archaeology. Please reference the HPO project number 15-1796 in any future calls, emails, or written correspondence in order to expedite our review and response.

Sincerely,

Katherine J. Marcopul
Deputy State Historic
Preservation Officer

KJM/VM

HISTORIC PRESERVATION OFC
27 OCT 17
RCVD

State of New Jersey

DEPARTMENT OF TRANSPORTATION
P.O. Box 600
Trenton, New Jersey 08625-0600

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

RICHARD T. HAMMER
Commissioner

15-1796-3 VM
HPO-K2017-090

October 26, 2017

Katherine J. Marcopul, Ph.D.
Administrator and Deputy State Historic Preservation Officer
NJ Department of Environmental Protection
Historic Preservation Office
P.O. Box 404
Trenton, NJ 08625-0404

Attn: Lindsay Thieverage
Vincent Maresca

Re: South Jersey Regional Airport Widening of Runway 8-26
And Ancillary Improvements
Township of Lumberton, Burlington County
Section 106 Consultation

Dear Dr. Marcopul:

The New Jersey Department of Transportation (NJDOT) has initiated environmental studies prior to beginning the design of modifications to the South Jersey Regional Airport in Lumberton Township, Burlington County using funding provided by the Federal Aviation Administration (FAA). It is anticipated that FAA funding will also be used for design and construction of the project. The modifications are required to maintain safe and efficient airport operations, and will address non-standard conditions of the existing runway and taxiway system, bringing Runway 8-26 to standard for current design aircraft, and relocating Taxiway A to meet standards for future design aircraft. An initial assessment of anticipated permits indicated that the following NJDEP permits/approvals will be required:

NJDEP Freshwater Wetlands Individual Permit and Water Quality Certificate
NJDEP Flood Hazard Area Individual Permit
NJDEP construction Activity Stormwater General Permit

The South Jersey Regional Airport encompasses approximately 658 acres, and is publicly owned by the State of New Jersey and administered by the NJDOT's Division of Aeronautics. Existing land use in the vicinity of the airport includes a mix of agricultural and wooded areas, low-density residential developments, and scattered commercial properties. The core of the airport property contains landside and airside facilities; agricultural row-crops; open, maintained fields; freshwater wetlands and open waters. Mason's Creek, a perennial watercourse flows through the core of the airport property from south to north along, and forming a portion of the western property boundary. An unnamed tributary of the south Branch Rancocas Creek flows through an area adjacent to the airport on the eastern side. Three unnamed tributaries of Mason's Creek flow west across the core of the airport property.

According to the 2015 Master Plan Update for the airport, the airport itself is comprised of a single east-west runway (identified as 08/26), 3,881 feet in length; four taxiways (identified as Taxiway A through D); a terminal complex including a main building, multiple hangers (one of which houses the Air Victory Museum), aircraft maintenance building, fuel storage area, and parking for both vehicles and planes; aprons (Main, Transient and East); and three industrial buildings at the east end of the airport. The latter buildings were constructed as wood framed hanger buildings in the 1960s. Hangers A and D in the Terminal area were both built in 1988, while two additional hangers that are no longer extant were built in the mid-1960s. Dates of construction for the four Community Hangers (CH) in the terminal area are somewhat less precise, with construction dates ranging from 1980-93 for CH 2, 1993 for CH 3, and 1996/97 for CH 1; the date of construction for CH4 has not yet been determined.

This letter initiates Section 106 consultation and requests your concurrence with the finding that ***no historic properties*** will be affected pursuant to 36 CFR 800.4(d)(1) by the proposed South Jersey Regional Airport Phase I Airfield Improvements project.

Project Description

The proposed project is comprised of the following components:

1. Widening of Runway 8-26 from 50 feet to 60 feet;
2. Regrade Runway 8-26 and the surrounding Runway Safety Area (RSA);
3. Provide turf shoulders along the runway and turf blast pads at each end;
4. Clear the surrounding Runway Object Free Area (ROFA), including tree removal to the degree practicable;
5. Relocate and widen parallel Taxiway "A" from approximately 20 feet to 25 feet and extend connecting taxiways; and
6. Relocate the segmented circle and wind cone.

Ancillary work will include:

1. Site preparation, grading, drainage and stormwater management facilities;

2. Replacement of the existing culvert crossing of Mason's Creek with a three-sided box culvert, or modification of the existing crossing by adding two 48-inch culverts;
3. Demolition/removal of existing Taxiway "A" pavement;
4. Runway/taxiway lighting and markings; and
5. Trenching for buried utilities.

Alternatives considered included the No-action alternative, building a new airport to FAA standards, relocating operations to an existing nearby airport, and relocation of the existing runway and taxiway. Fourteen scenarios were considered for the relocation of the existing runway and taxiway and were dismissed because of excessive environmental impacts and costs.

800.3 Initiation of Consultation

At the request of the FAA, NJDOT staff initiated technical assistance discussions for the airport project with Vincent Maresca in July of 2017. Using information compiled by AECOM archaeologists the discussions focused on the potential for the proposed work to have an adverse effect on historic properties—notably archeological resources, and an appropriate field testing strategy to investigate that possibility. The net result of those discussions was agreement that in-field testing was required because of existing knowledge about extensive Native American occupation along Mason's Creek, and the inference of minimal ground disturbance from prior runway construction. Mr. Maresca advised that testing in the Eastern portion of the project area (to the east of Station 124+75) was unnecessary because of a significantly lower archeological sensitivity. The Area of Potential Effects (APE) was subsequently revised from that initially proposed by AECOM and includes all areas within which historic properties (should they exist) could be affected by the proposed construction. The APE for archeological resources is restricted to those areas where ground disturbance will occur—or all areas within the Limits of Disturbance and a variable 50 to 150-foot buffer zone to accommodate ancillary construction activities and disturbance. The APE for architectural properties is limited to those properties which may be affected by the proposed construction. Because the majority of the work is extremely low in profile (much at ground level or below) and will not require removal of any structures, only those structure adjacent to the proposed project were assessed.

Consulting parties for the project who would sign a Memorandum of Agreement (should one be required) include the following:

Federal Aviation Administration FAA Harrisburg Airports District Office
NJ Historic Preservation Office/NJ SHPO
NJ Department of Transportation

Federally recognized Tribes who may have an interest in the project should Pre-Contact archeological sites be identified (and who may be signatories to a Memorandum of Agreement should one be required) include:

Absentee Shawnee Tribe of Indians of Oklahoma
Delaware Nation, Oklahoma
Delaware Tribe of Indians
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe

Stockbridge-Munsee Community, Wisconsin

Non-federally recognized tribes who may have an interest in the project should Pre-Contact archeological sites be identified include:

Nanticoke Lenni-Lenape Indian of New Jersey
Powhatan Renape Nation
Ramapough Lunaape Nation
Sand Hill Band of Indians
Sand Hill Indian Historical Association
Cherokee Nation of New Jersey
Cherokee Tribe of New Jersey

Others who may have an interest in the project include:

Air Victory Museum
Civil Air Patrol, Air Victory Museum
Lumberton Township
Lumberton Historical Society
Burlington County Division of Parks Cultural & Heritage Affairs
Burlington County Historical Society

800.4 Identification of Historic Properties

Background research revealed that both historic architectural and archeological properties have been identified in close proximity to the current APE. The Lumberton Rural Agricultural District (SHPO Opinion 9/12/2001) lies to the east of the current APE. The Koens-Crispin Archaeological Site (28Bu2) is located near the western portion of the APE between Mason's Creek and Ark Road. Additional Pre-contact archeological sites have been recorded in the area and are associated with the floodplains of the East and West Branches of Mason's Creek. Pre-Contact artifacts have also reportedly been found in the agricultural fields west of Ark Road.

Minimal reconnaissance level historic architectural survey was undertaken. None of the buildings in the APE serve an agricultural function, thus there is no relationship between those structures and the Lumberton Rural Agricultural District. All of the structures in the APE and on the airport property are utilitarian in nature and related to the airport's function. They range in date of construction from the 1960s to ca. 1996-97, and many exhibit interior and exterior alterations. Only two similarly constructed former hanger structures are located within the APE. Neither of these buildings appears to meet the National Register criteria.

Archeological survey of the APE recovered both pre-Contact and historic period artifacts. A concentration of pre-Contact lithics was identified in an area north of the runway between approximately Stations 118+75 and 122+25. Waste flakes from tool manufacture/maintenance, altered cobbles (some possibly altered during agricultural use of the area), an argillite point tip, and a small amount of faunal remains (primarily shellfish) were recovered from both plowzone and sub-plowzone contexts. Because the site may have integrity and the ability to yield information important in prehistory the site was recommended as being potentially eligible for listing in the National Register of Historic Places. Pre-

Contact archeological materials were also found in several shovel tests across the site. Negative radial testing indicated the artifacts were recovered from disturbed contexts or considered isolated finds.

The light scatter of historic material was recovered from a plowzone context throughout the APE. These materials were generally small and fragmented in nature—undoubtedly due to the agricultural use of the property. The assemblage was comprised primarily of household ceramics and construction materials, but also included smaller amounts of personal items, glass bottles, commercial containers, and "clay pigeon" fragments; and faunal remains. The artifacts, dating from the second quarter of the 19th century through the early 20th century, are not from primary deposit, have little research value, and are not considered potentially eligible for listing in the National Register of Historic Places

800.5 Assessment of Adverse Effects

The pre-Contact archeological site identified during testing for the current project lies wholly outside of the limits of disturbance as currently defined on preliminary plan sheets. Although the formal design phase has not yet been initiated, NJDOT's consultant, AECOM, has advised that the site can be avoided and protected by substantial fencing during construction. AECOM has also suggested (and NJDOT has agreed) that a permanent survey marker be installed so that the site can easily be relocated with precision. In addition, the limits of the site as defined by NV5 will be included on plans for the current project and documented on "As-Built" plans once the project is finished to ensure that future South Jersey airport projects avoid impacting it to the degree possible.

Based on the information presented in the enclosed management summary and described in this letter, the NJDOT requests on behalf of the FAA your concurrence with the finding that pursuant to 36 CFR 800.4(d)(1), ***no historic properties*** will be affected by the proposed South Jersey Regional Airport Phase I Airfield Improvements project with the understanding that:

1. All proposed work, including construction access, staging areas and project construction will be specifically precluded from using any part of the identified site via substantial fencing;
2. Project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction;
3. A permanent survey marker will be installed to assist with the accurate relocation of the site in the future;
4. The pre-Contact site identified during the current survey work will be registered with the New Jersey State Museum; and
5. Additional archeological testing will be undertaken to provide information about the pre-Contact site's integrity and assess its eligibility for listing in the National Register of Historic Places. The testing will be limited to the excavation of four 3 x 3' units within the site's core area. A single archeological report meeting the NJ SHPO standards that describes the field testing and results for both the initial and subsequent Phase II testing will be prepared and submitted in draft to the NJ SHPO by February 28, 2018.

As the NJDOT's consultant is scheduled to complete the draft of the Environmental Assessment (EA) for this project in the first week of November, we would appreciate receiving your concurrence with the

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HPO-K2017-090

finding that ***no historic properties*** will be affected by the proposed project so that it can be incorporated into the draft EA as soon as possible. To facilitate your review a concurrence line has been included at the conclusion of this letter. Should you require any additional information during the course of your review, please do not hesitate to me.

Very truly yours,

Lauralee Rappleye
Project Manager/Archeologist
Bureau of Environmental Program Resources

Enclosure: *South Jersey Regional Airport Cultural Resources Survey, Phase I End of Field Memorandum and Management Summary, October 9, 2017*
Proposed Improvements Graphic

C:	E. Gabsewics, FAA Harrisburg Airports	via email, w/enclosures
	Air Victory Museum	w/o enclosures
	Civil Air Patrol, Air Victory Museum	"
	Lumberton Township	"
	Lumberton Historical Society	via email, w/o enclosures
	Burlington County Div. of Parks Cultural & Heritage Affairs	w/o enclosures
	Burlington County Historical Society	"
	A. Velasquez, AECOM	via email, w/ enclosures
	G. Leipfinger, NJDOT, Aeronautics	"
	A. Patel, NJDOT, Aeronautics	"

✓

I concur, ***no historic properties*** will be affected pursuant to 36 CFR 800.4(d)(1) by the proposed South Jersey Regional Airport Phase I Airfield Improvements project with the understanding that:

1. All proposed work, including construction access, staging areas and project construction will be specifically precluded from using any part of the identified site via substantial fencing;
2. Project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction;
3. A permanent survey marker will be installed to assist with the accurate relocation of the site in the future; and

15-1796-3
HPO-K2017-090

4. The pre-Contact site identified during the current survey work will be registered with the New Jersey State Museum; and
5. Additional archeological testing will be undertaken to provide additional information about the pre-Contact site's integrity and assess its eligibility for listing in the National Register of Historic Places. The testing will be limited to the excavation of four 3 x 3' units within the site's core area. A single archeological report meeting the NJ SHPO standards that describes the field testing and results for both the initial and subsequent Phase II testing will be prepared and submitted in draft to the NJ SHPO by February 28, 2018.

No further work is required to comply with Section 106 of the National Historic Preservation Act, as amended. Should the footprint of the project change or unanticipated discoveries are made during construction; pursuant to 36 CFR 800.4 and/or 800.13 re-evaluation of the findings and continuing Section 106 consultation may be required.

_____ I do not concur for the following reason(s):

Katherine J. Marcopul

Katherine J. Marcopul, Ph.D.
Deputy State Historic Preservation Officer

11/13/2017
Date

Velazquez, Anthony

From:	Protus, Alicia <alicia_protus@fws.gov>
Sent:	Tuesday, September 11, 2018 11:37 AM
To:	Scelsi, Paula
Cc:	Velazquez, Anthony
Subject:	Re: [EXTERNAL] South Jersey Regional Airport Widening of Runway 08-26 and Ancillary Improvements
Attachments:	2017-I-1117 SJ Regional Airport.PDF

Hi Paula and Anthony,

The requested bog turtle survey indicated likely absence of bog turtles within the action area of the South Jersey Regional Airport Airfield Improvement Project. Based on this, the Service's original NLAA concurrence letter dated February 27, 2018 (attached) stands. No further Section 7 consultation for this project is required, unless the project scope is expanded during final design or pre-construction (ie. which would be grounds for re-initiation).

Sincerely,
Alicia Protus

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service
New Jersey Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
p: (609) 382-5266
e: Alicia_Protus@fws.gov

On Mon, Sep 10, 2018 at 10:01 PM, <Anthony.Velazquez@aecom.com> wrote:

Anthony Velazquez has sent you 1 file using AECOM's File Transfer System.

Anthony Velazquez says:

Hello,

We are transmitting the linked Phase 2 Bog Turtle Survey Report on behalf of the project sponsor, the New Jersey Department of Transportation (NJDOT) and Lead Federal Agency, the Federal Aviation Administration (FAA).

Please contact me if you have any trouble retrieving the files.

Thank you,
Anthony Velazquez
856-981-5823

This file will be available for download until 9/17/2018

File	Description	Size
VAY Phase 2 Bog Turtle Survey Report Final.pdf		21,275KB

Download all files (.zip)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
Tel: 609/646 9310
www.fws.gov/northeast/njfieldoffice/

IN REPLY REFER TO:
2017-I-1117

FEB 27 2018

Paula Scelsi
New Jersey Department of Transportation
1035 Parkway Avenue
Trenton, New Jersey 08625-0600
Email: paula.scelsi@dot.nj.gov

Reference: South Jersey Regional Airport Airfield Improvements, Lumberton Township, Burlington County, New Jersey

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced proposed project pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. The following comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comment by the Service as afforded by other applicable environmental legislation.

A known occurrence or potential habitat for the following federally listed or candidate species is located on or near the project's impact area. However, the Service concurs that the proposed project is not likely to adversely affect federally listed or candidate species for the reasons listed below.

Species	Basis for Determination
Northern long-eared bat (*Myotis septentrionalis*), threatened	No documented roosts or hibernacula occur <0.25 miles of project site. A Northern Long-eared Bat 4(d) Rule Streamlined Consultation Form was received for this project.
Bog turtle (*Clemmys* [*Glyptemys*] *muhlenbergii*), threatened	The potential impact of the proposed project on the hydrology of the suitable bog turtle habitat north and south of the airport runway is not known at this time. As per the February 23 email with Edward Gabsewics, the phase 2 survey for bog turtles will be conducted to determine presence/ likely absence of bog turtle prior to final design of the project and the action agency shall re-initiate consultation with the Service if survey results are inconclusive or indicate presence of bog turtles. The Service concurs that the project is not likely to adversely affect the bog turtle in the event surveys indicate likely absence of the species.
Swamp pink (*Helonias bullata*), threatened	Suitable habitat for the species is present in wetlands both upstream and downstream of the project however; species surveys conducted by Anthony Velazquez indicate that swamp pink is not present in the project action area.

Except for the above-mentioned species, no other federally listed or proposed threatened or endangered flora or fauna under Service jurisdiction are known to occur within the proposed project's impact area. Therefore, no further consultation pursuant to the ESA is required. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

Please refer to this office's web site at http://www.fws.gov/northeast/njfieldoffice/Endangered/ for further information including federally listed and candidate species lists, procedures for requesting ESA review, the National Bald Eagle Management Guidelines, and contacts for obtaining information from the New Jersey Natural Heritage and Endangered and Nongame Species Programs regarding State-listed and other species of concern.

Reviewing Biologist: Alicia Protus
Alicia Protus

Authorizing Supervisor:
Ron Popowski

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.):

Federal Aviation Administration
Edward Gabsewics
717-730-2832
Edward.Gabsewics@faa.gov

Project Name:

South Jersey Regional Airport - Widening of Runway 8-26

Project Location (include coordinates if known):

E(x):395,818.844 N(y): 404,411.253

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

Basic Project Description (provide narrative below or attach additional information):

In order to maintain safe and efficient airport operations, the New Jersey Department of Transportation proposes to modify Runway 8-26 to meet Federal Aviation Administration (FAA) standards for the current design aircraft (B-I) by widening the runway grade to 60 feet and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). In addition to site preparation, grading, drainage, and stormwater management facilities associated with the runway and taxiway improvements, the project will also involve installation of new runway/taxiway lighting, clearing the surrounding Runway Object Free Area (ROFA) including tree removal to the degree practicable, as well as replacement of the existing (five, 48" corrugated metal pipes [CMP]) culvert crossing of Masons Creek with a three-sided rigid frame structure. The Proposed Action would not increase the capacity of the airport or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways.

General Project Information	**YES**	**NO**
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion	0.05	
If known, estimated acres[5] of forest conversion from April 1 to October 31		
If known, estimated acres of forest conversion from June 1 to July 31[6]		
Does the project include timber harvest? (if yes, report acreage below)	☐	☒
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: Edward S. Galowich Date Submitted: 12/5/2017

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
Phone: (609) 646-9310 Fax: (609) 646-0352
http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

In Reply Refer To: October 16, 2017
Consultation Code: 05E2NJ00-2017-SLI-1117
Event Code: 05E2NJ00-2018-E-00166
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species that may occur in your proposed action area and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.)

If the enclosed list indicates that any listed species may be present in your action area, please visit the New Jersey Field Office consultation web page as the next step in evaluating potential project impacts: http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

On the New Jersey Field Office consultation web page you will find:

- habitat descriptions, survey protocols, and recommended best management practices for listed species;
- recommended procedures for submitting information to this office; and
- links to other Federal and State agencies, the Section 7 Consultation Handbook, the Service's wind energy guidelines, communication tower recommendations, the National Bald Eagle Management Guidelines, and other resources and recommendations for protecting wildlife resources.

The enclosed list may change as new information about listed species becomes available. As per Federal regulations at 50 CFR 402.12(e), the enclosed list is only valid for 90 days. Please return to the ECOS-IPaC website at regular intervals during project planning and implementation to obtain an updated species list. When using ECOS-IPaC, be careful about drawing the boundary of your Project Location. Remember that your action area under the ESA is not limited to just the footprint of the project. The action area also includes all areas that may be indirectly affected through impacts such as noise, visual disturbance, erosion, sedimentation, hydrologic change,

chemical exposure, reduced availability or access to food resources, barriers to movement, increased human intrusions or access, and all areas affected by reasonably forseeable future that would not occur without ("but for") the project that is currently being proposed.

We appreciate your concern for threatened and endangered species. The Service encourages Federal and non-Federal project proponents to consider listed, proposed, and candidate species early in the planning process. Feel free to contact this office if you would like more information or assistance evaluating potential project impacts to federally listed species or other wildlife resources. Please include the Consultation Tracking Number in the header of this letter with any correspondence about your project.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

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

This species list is provided by:

New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
(609) 646-9310

Project Summary

Consultation Code: 05E2NJ00-2017-SLI-1117

Event Code: 05E2NJ00-2018-E-00166

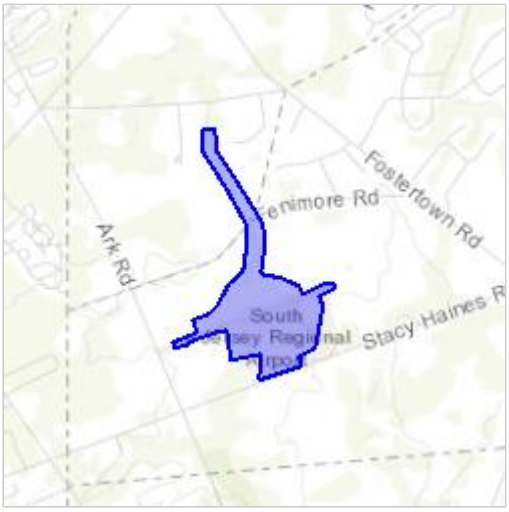
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

Project Type: TRANSPORTATION

Project Description: The Proposed Action involves widening of the runway grade to 60 feet; construction of a partial parallel taxiway south of the runway; and an increase to the runway to taxiway separation to adhere to the FAA design standards.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.946940396065706N74.84572468840386W



Counties: Burlington, NJ

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Bog Turtle *Clemmys muhlenbergii* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

Flowering Plants

NAME	STATUS
Swamp Pink *Helonias bullata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333	Threatened

Critical habitats

There are no critical habitats within your project area under this office's jurisdiction.

USFWS National Wildlife Refuges And Fish Hatcheries

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

There are no refuges or fish hatcheries within your project area.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are USFWS Birds of Conservation Concern that might be affected by activities in this location. The list does not contain every bird you may find in this location, nor is it guaranteed that all of the birds on the list will be found on or near this location. To get a better idea of the specific locations where certain species have been reported and their level of occurrence, please refer to resources such as the E-bird data mapping tool (year-round bird sightings by birders and the general public) and Breeding Bird Survey (relative abundance maps for breeding birds). Although it is important to try to avoid and minimize impacts to all birds, special attention should be given to the birds on the list below. To get a list of all birds potentially present in your project area, visit the E-bird Explore Data Tool.

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Buff-breasted Sandpiper *Tryngites subruficollis* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Black Skimmer *Rynchops niger* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Bobolink *Dolichonyx oryzivorus* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Jul 31
Canada Warbler *Wilsonia canadensis* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Aug 10

Cerulean Warbler *Dendroica cerulea* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/2974	Breeds Aug 20 to Jul 20
Clapper Rail *Rallus longirostris* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8937	Breeds Apr 10 to Oct 31
Dunlin *Calidris alpina arcticola* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Evening Grosbeak *Coccothraustes vespertinus* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Eastern Whip-poor-will *Caprimulgus vociferus* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Aug 20
Gull-billed Tern *Gelochelidon nilotica* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
Golden-winged Warbler *Vermivora chrysoptera* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Kentucky Warbler *Oporornis formosus* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Aug 20
King Rail *Rallus elegans* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Long-eared Owl *asio otus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/3631	Breeds elsewhere
Least Tern *Sterna antillarum* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Sep 10
Lesser Yellowlegs *Tringa flavipes* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler *Dendroica discolor* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* **Bird of Conservation Concern (BCC)**	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus*	Breeds May 10 to Sep 10

Bird of Conservation Concern (BCC)

Red-throated Loon *Gavia stellata* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Saltmarsh Sparrow *Ammodramus caudacutus* — Breeds May 15 to Sep 5
Bird of Conservation Concern (BCC)

Short-billed Dowitcher *Limnodromus griseus* — Breeds elsewhere
Bird of Conservation Concern (BCC)
https://ecos.fws.gov/ecp/species/9480

Semipalmated Sandpiper *Calidris pusilla* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Seaside Sparrow *Ammodramus maritimus* — Breeds May 10 to Aug 20
Bird of Conservation Concern (BCC)

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31
Bird of Conservation Concern (BCC)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeas

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1E
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1C
- PFO1/SS1C
- PSS1B
- PFO1/EM1E
- PSS1C

FRESHWATER POND

- PAB4Hx
- PUBHx
- PUBHh

OTHER

- Pf

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks & Forestry
State Forestry Service
Mail Code 501-04
Office of Natural Lands Management – Natural Heritage Program
P.O. Box 420
Trenton, NJ 08625-0420
Tel. (609) 984-1339 Fax. (609) 984-1427

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

March 30, 2017

Anthony J. Velazquez
AECOM
30 Knightsbridge Road, Suite 520
Piscataway, NJ 08854

Re: South Jersey Regional Airport Phase I Airfield Improvements
Block(s) - 36, Lot(s) - 14
Lumberton Township, Burlington County

Dear Mr. Velazquez:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.1) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Natural Heritage Data Request Form into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

This report does not include information concerning known Northern Long-eared Bat hibernacula and maternity roost trees protected under the provisions of the U.S. Fish & Wildlife Service's 4(d) Rule. You must contact the U.S. Fish & Wildlife Service, New Jersey Field Office, for additional information concerning the location of these features, or visit their website at: http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

We have also checked the Landscape Project habitat mapping and Biotics Database for all occurrences of rare wildlife species or wildlife habitat within one mile of the referenced site. Please refer to Table 3 (attached) to determine if any rare wildlife species or wildlife habitat is documented within one mile of the project site. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on the project site.

NHP File No. 17-3907487-11629

For requests submitted as part of a Flood Hazard Area Control Act (FHACA) rule application, we report records for all rare plant species and ecological communities tracked by the Natural Heritage Program that may be on, or in the immediate vicinity of, your project site. A subset of these plant species are also covered by the FHACA rules when the records are located within one mile of the project site. One mile searches for FHACA plant species will only report precisely located occurrences for those wetland plant species identified under the FHACA regulations as being critically dependent on the watercourse. Please refer to Table 3 (attached) to determine if any precisely located rare wetland plant species covered by the FHACA rules have been documented. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on, or in the immediate vicinity of, the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1, 2 and 3 (attached) to determine if any priority sites are located on, in the immediate vicinity, or within one mile of the project site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive NJ-GeoWeb website at the following URL, http://www.state.nj.us/dep/gis/geowebsplash.htm or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Robert J. Cartica
Administrator

c: NHP File No. 17-3907487-11629

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	**Included**	**Number of Pages**
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	**Included**	**Number of Pages**
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Thursday, March 30, 2017

NHP File No.: 17-3907487-11629

Other Animal Species
In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 3: Within 1 Mile for FHACA Searches (6 possible reports)

Report Name	Included	Number of Pages
1. Rare Plant Species Occurrences Covered by the Flood Hazard Area Control Act Rule Within One Mile of the Project Site Based on Search of Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within 1 mile	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Great Blue Heron	Ardea herodias	Nesting Colony	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1378
Potential vernal habitat area	1388

Total number of records: 2

Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Appendix B
Survey and Habitat Assessment Reports

AECOM

South Jersey Regional Airport
Swamp Pink Survey Report

Widening of Runway 8-26 and Ancillary Improvements
Lumberton Township, Burlington County

November 22, 2017

Prepared for:

New Jersey Department of Transportation
1035 Parkway Avenue
Trenton, NJ 08625

Prepared by:

AECOM Transportation

AECOM
30 Knightsbridge Road
Piscataway
NJ, 08854
USA
aecom.com

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Appendix B Photo Display
Appendix C Wetland Delineation Report

1.0 Project Description

The New Jersey Department of Transportation (NJDOT) is proposing airfield safety improvements at South Jersey Regional Airport in coordination with the Federal Aviation Administration (FAA), the lead federal agency. The airport is located along Stacy Haines Road in Lumberton Township, Burlington County, New Jersey. The Project is located on the United States Geological Survey (USGS) Mount Holly NJ 7.5-minute topographical quadrangle. Neighboring townships include Hainesport to the north, Medford to south and Mount Laurel to the west (**Figure 1**).

In order to maintain safe and efficient airport operations, the NJDOT proposes to modify Runway 8-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). The Proposed Action would not increase the capacity or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways.

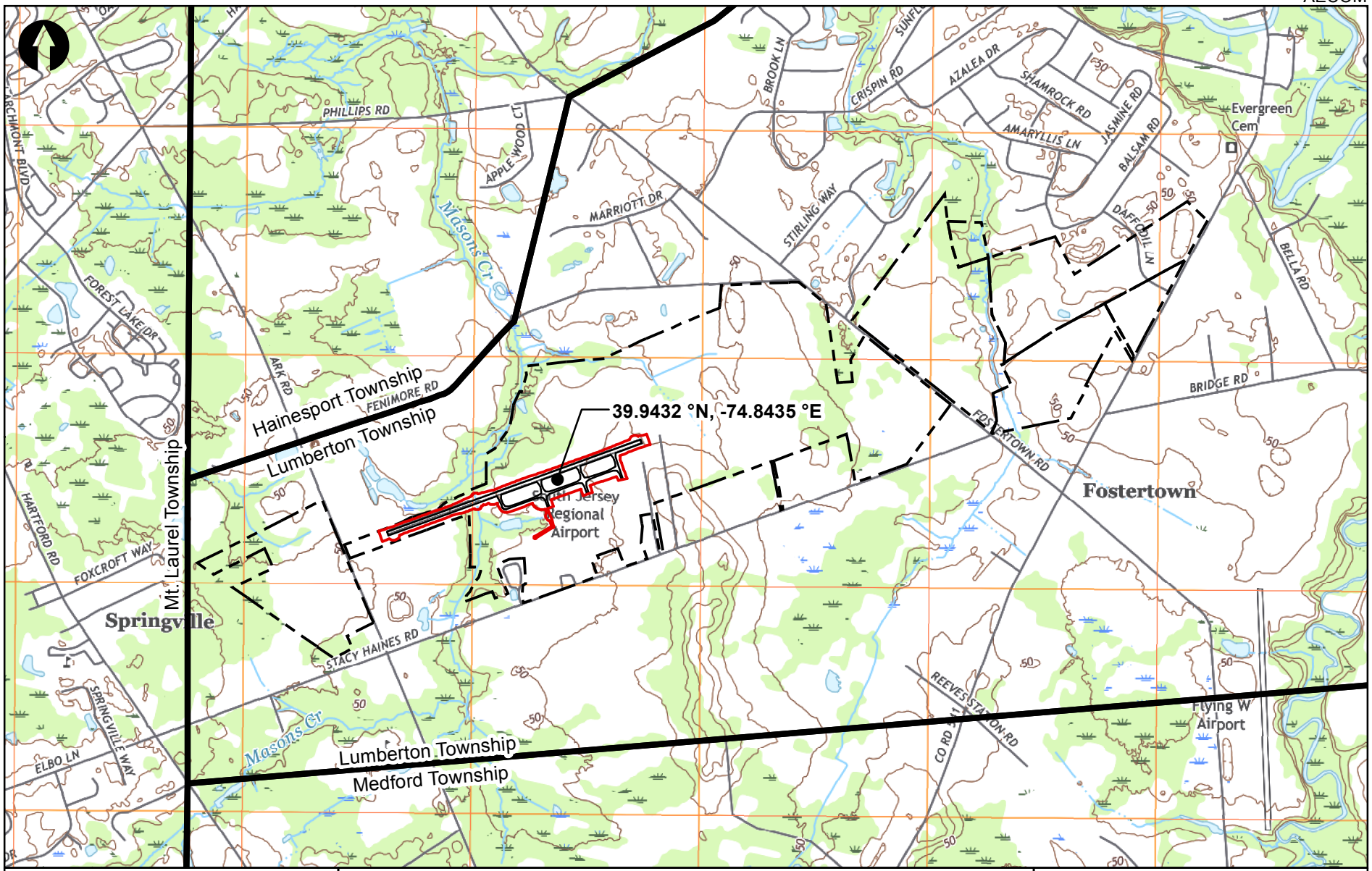
The major elements of the project include:

- Widen Runway 8-26 from 50 feet to 60 feet
- Regrade Runway 8-26 and the surrounding Runway Safety Area (RSA)
- Provide turf shoulders along the runway and turf blast pads at each end
- Clear the surrounding Runway Object Free Area (ROFA) including tree removal to the degree practicable
- Relocate and widen parallel Taxiway “A” from approximately 20 feet to 35 feet, and extend the connecting taxiways
- Relocate the segmented circle and wind cone

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing culvert crossing of Masons Creek with a three-sided rigid frame structure. The new bridge structure will incorporate channel restoration and stabilization of Masons Creek.
- Demolition/removal of existing Taxiway “A” pavement
- Runway/taxiway lighting and markings
- Trenching for buried utilities

The locations of these key project features are shown in **Figure 2**.



Legend

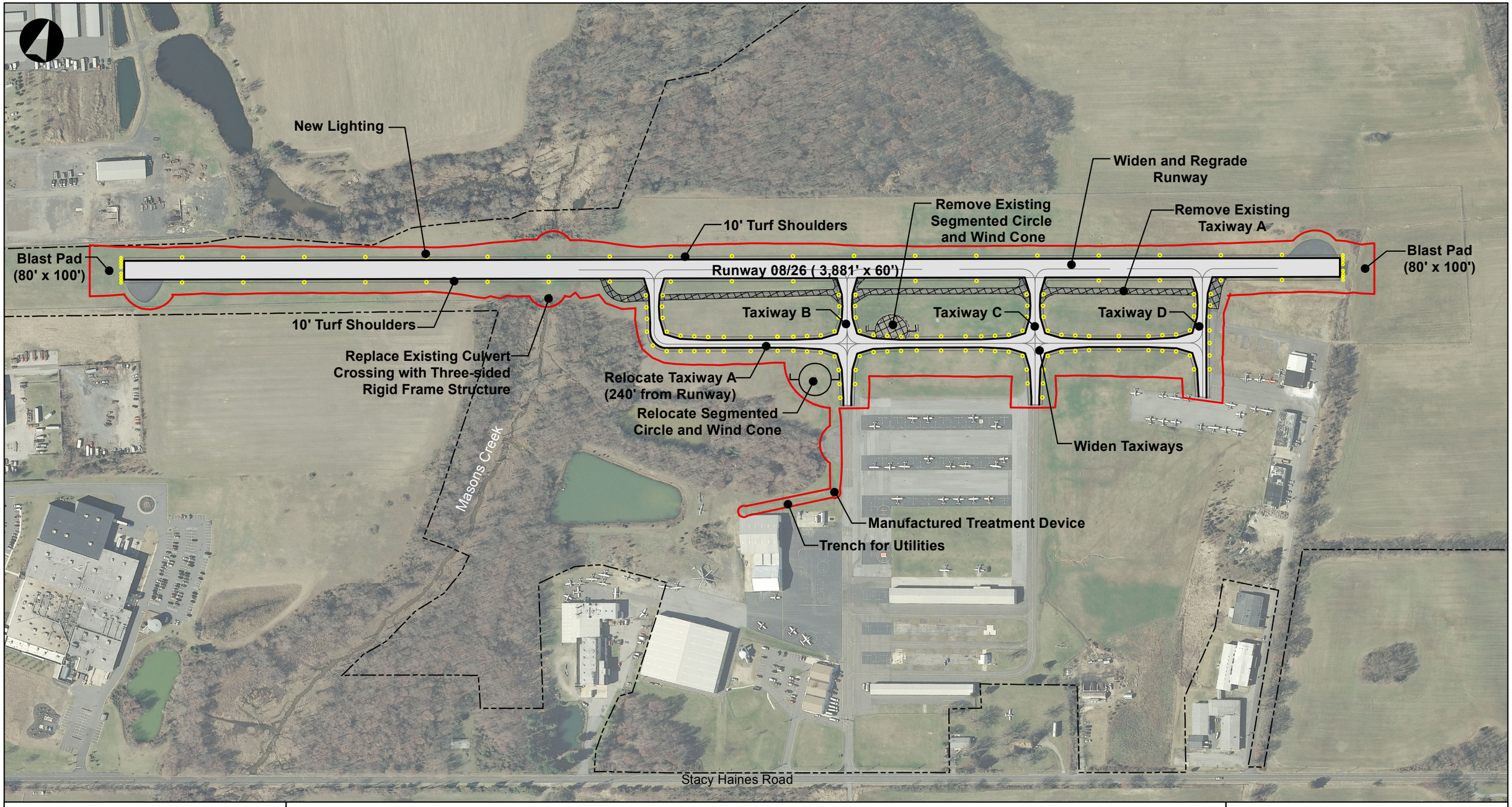
- Project Area
- Airport Property

Project Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USGS Mount Holly US Topographic 7.5' quadrangle

Figure 1



300 150 0 300
Feet

Legend

- Project Area
- Airport Property

Proposed Improvements

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 2

2.0 Purpose and Scope of Study

To initiate project consultation in accordance with U.S. Fish and Wildlife Service (USFWS) New Jersey Field Office guidelines, the "action area" for the study area was delineated (**Figure 3**). The action area generally includes the project limits of disturbance (LOD) and immediate surrounding areas, wetlands and waterways down-gradient of the proposed construction, and downstream areas within one mile. The Information, Planning, and Conservation (IPaC) system was utilized to obtain a species list for the action area, which identified swamp pink (*Helonias bullata*) amongst other federally listed species. Swamp pink is a federally listed threatened species and a New Jersey state endangered species. A search of the New Jersey Natural Heritage Program (NHP) Database for records of rare or endangered species and natural communities on or near the project site did not identify swamp pink. Copies of the IPaC list and NHP data request response have been included in **Appendix A**.

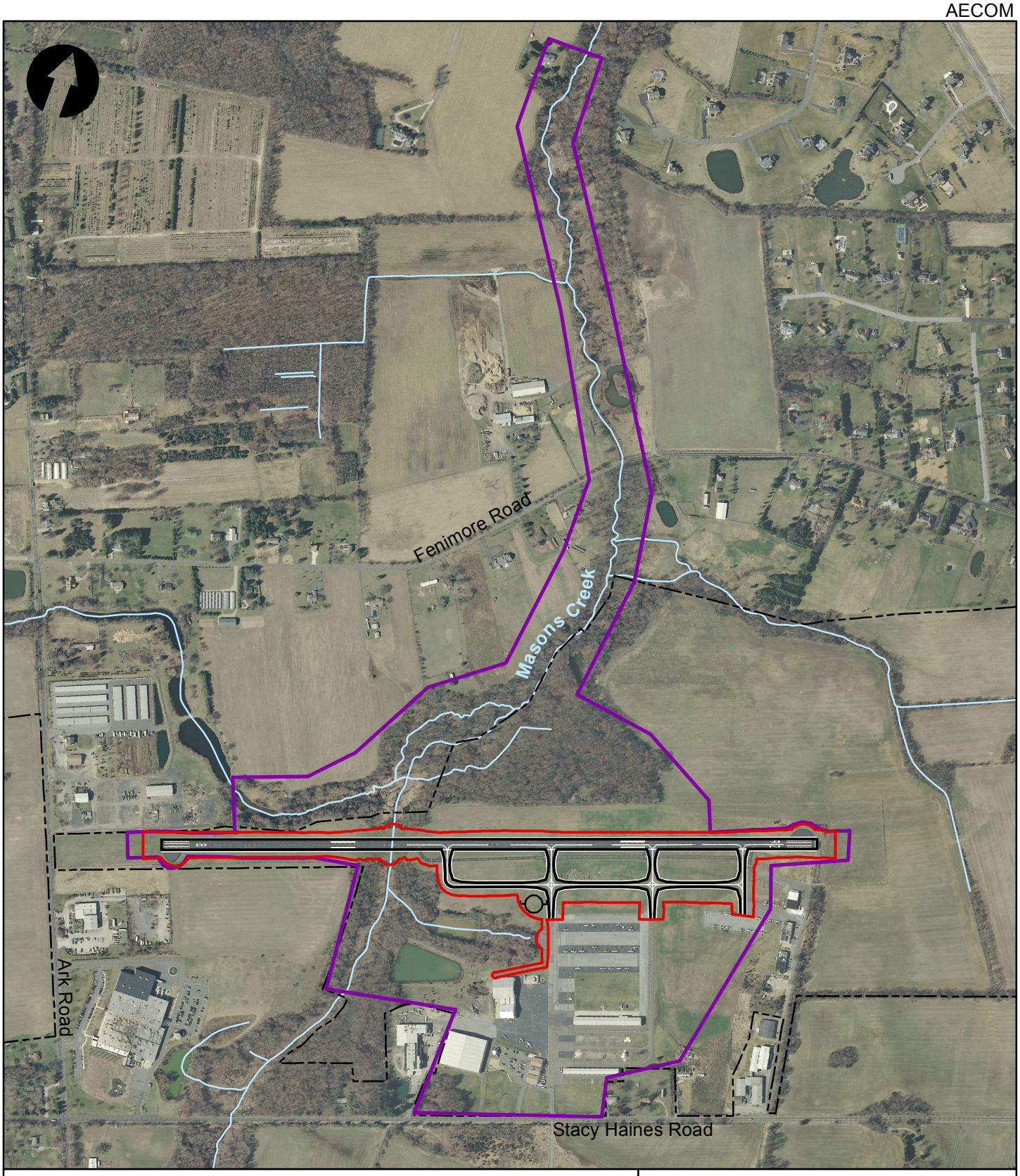
The Preferred Alternative is the subject of an Environmental Assessment (EA), which is being prepared pursuant to the National Environmental Policy Act of 1969 (NEPA). This report has been prepared to document field activities performed to determine whether or not swamp pink occurs within the action area, and to support consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA – 16 U.S.C. 1531-1544, 87 Stat. 884, as amended).

3.0 Swamp Pink Habitat Requirements

Swamp pink is a shade tolerant perennial plant that occurs in forested freshwater wetlands. The species is mainly found in Atlantic white cedar (*Chamaecyparis thyoides*) bogs and red maple (*Acer rubrum*) swamps. *Helonias* habitat is further characterized as forested headwater wetlands bordering meandering streams. Sphagnum covered hummocks formed by tree and shrub roots provide good habitat for the species, as do small areas of standing water within bogs.

Canopy structure plays an important role in *Helonias* habitat. The canopy must provide ample shade for the species, and restrict the growth of competitive successional species. More significant to the habitat requirements of *Helonias* is the hydrologic conditions. The water table must occur at or near the surface, with minimal seasonal fluctuations or floodwater inundation.

Primary associate species include Atlantic white cedar, red maple, pitch pine (*Pinus rigida*), black gum (*Nyssa sylvatica*), sweetbay magnolia (*Magnolia virginiana*), American holly (*Ilex opaca*), sweet pepperbush (*Clethera alnifolia*), skunk cabbage (*Symplocarpus foetidus*), and sphagnum moss (*Spahgnum spp.*).



800 400 0 800

Feet

Legend

- Project Area
- Airport Property
- Project Action Area

Project Action Area

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 3

4.0 Survey Methodology

Surveys for swamp pink were conducted on March 8th and 9th and on April 5th and 20th, 2017. The survey was conducted by Anthony J. Velazquez. Mr. Velazquez has a B.S. in Environmental Studies from Stockton College and is a Rutgers-Certified wetland delineator with over 20 years of experience managing and performing a wide variety of environmental studies. Mr. Velazquez has observed swamp pink populations in Cape May, Cumberland and Camden Counties, and has performed several swamp pink surveys, including a survey in coordination with USFWS personnel on the Camden County College Blackwood Campus.

Survey Areas were delineated on either side of the runway and encompassed predominantly forested portions of the Masons Creek floodplain (See **Figure 4**). In total, approximately 10 hours were spent performing the survey, with a focus on areas presenting the most suitable habitat. The survey was characterized by close visual inspection of the ground surface in all areas of suitable habitat. Particular attention was given to hummocky areas adjacent to small streamlets on the site. During the April 20th survey, a walking stick was utilized to push aside skunk cabbage (*Symplocarpus foetidus*) leaves and other vegetation that may have been obscuring the plants. Generally, areas of the Masons Creek floodplain exhibiting obvious field indicators of sedimentation, stormwater inundation and hydrologic disturbance, and/or monotypic stands of invasive species, such as Japanese stiltgrass (*Microstegium vimineum*), reed canary grass (*Phalaris arundinacea*) and common reed (*Phragmites australis*) were surveyed more quickly; and more stable areas were studied with greater intensity. Photographs of representative habitat conditions can be seen in **Appendix B**.

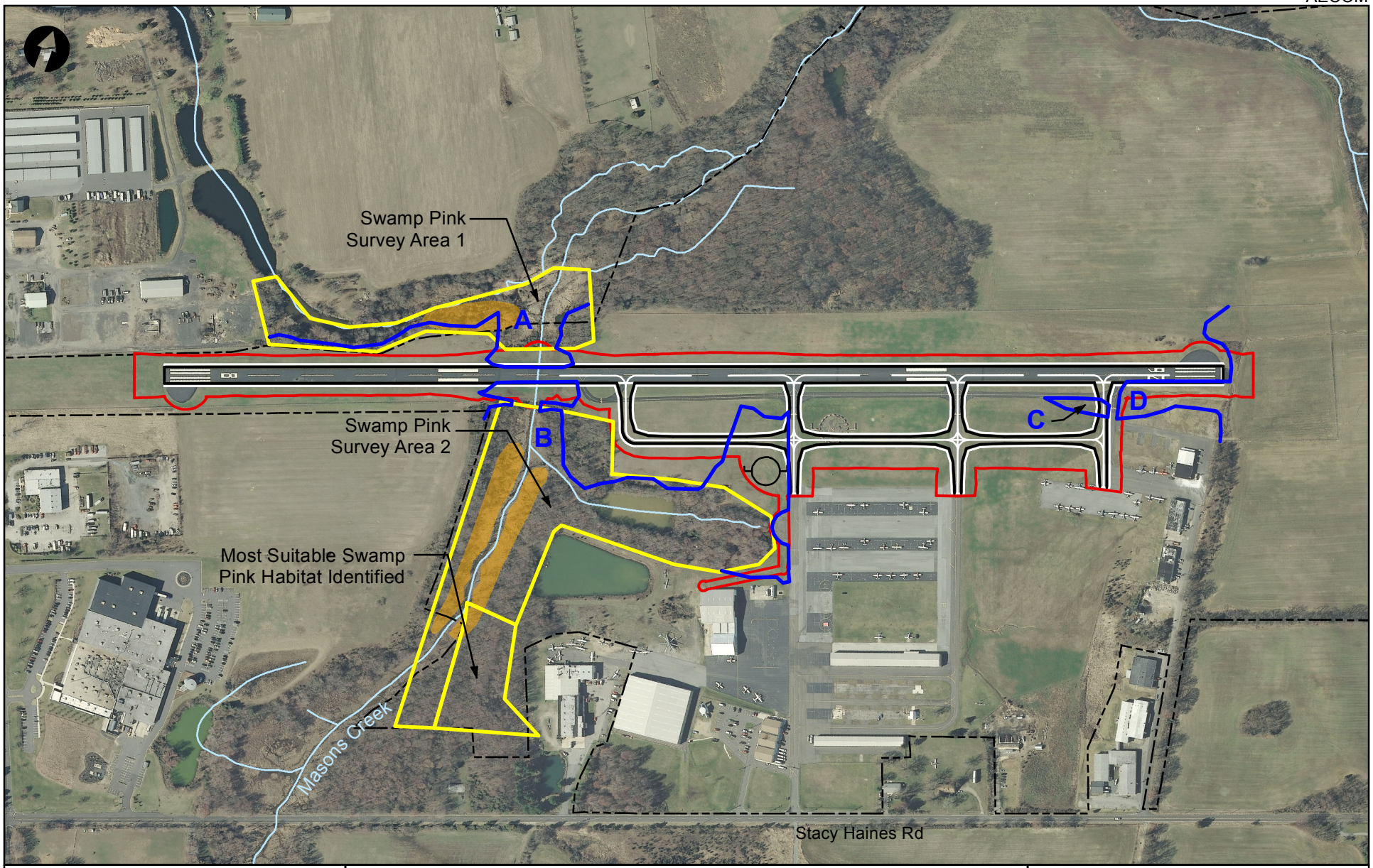
5.0 Survey Results

During AECOM's swamp pink survey, two areas were identified within the Study Area. These areas are described below, along with a discussion of their suitability to be considered potential swamp pink habitat. A copy of the *Wetland Delineation Report* (AECOM, June 2017) has been Included in **Appendix C**.

5.1 Survey Area 1

Survey Area 1 (approximately 4.45 acres) contains palustrine open water (POW), palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetland components associated with Masons Creek and an unnamed tributary to Masons Creek which closely parallels the airport property to the north of Runway 8-26. Primary associate species found in this survey area includes skunk cabbage and red maple. Other species found in this area include silky dogwood (*Cornus amomum*), Japanese stiltgrass, arrowwood viburnum (*Viburnum dentatum*), winterberry (*Ilex verticillata*) silver maple (*Acer saccharinum*), and sweetgum (*Liquidambar styraciflua*).

Hydrology in the area is provided by a high groundwater table and multiple persistent spring seeps located throughout the survey area. Additional sources of hydrology included surface water runoff from adjacent uplands, and overflow from the manmade ponds.



500 0 500

Feet

Legend

- Project Area
- Airport Property
- Swamp Pink Survey Area
- Spring Fed Mucky Substrate
- Delineated Wetlands

Habitat Survey Locations

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and Field Investigations March 2017

Figure 4

Much of the survey area around Masons Creek and its unnamed tributary has been previously disturbed and is dominated by various invasive species. The waterway of Masons Creek in this survey area has a steeply incised channel, while the tributary has been flooded in sections due to a series of small wooden and earthen dams. The small areas of remaining wetlands do not exhibit the stable hydrologic regime necessary for *Helonias*, and are mainly dominated by Japanese stiltgrass. Based on the present vegetation and hydrologic conditions observed, no areas of potential swamp pink habitat were found in Study Area 1, nor were any swamp pink individuals. Based on the survey, swamp pink is not believed to occur within Survey Area 1, or downstream within at least one mile.

5.2 Survey Area 2

Survey Area 2 (approximately 14.70 acres) contains palustrine open water (POW), palustrine emergent (PEM), palustrine scrub-shrub (PSS) and palustrine forested (PFO) wetland components associated with Masons Creek and its unnamed tributaries to the south of Runway 8-26. Primary associate species found in this survey area include red maple, skunk cabbage, cinnamon fern (*Osmundastrum cinnamomeum*) and sensitive fern (*Onoclea sensibilis*). Other dominant species found in this area include sweetgum, speckled alder (*Alnus incana*), silky dogwood, arrowwood viburnum, spicebush (*Lindera benzoin*), winterberry holly, poison ivy (*Toxicodendron radicans*), and various sedges (*Carex* spp.) and bulrushes (*Scirpus* spp.). Portions of the Masons Creek corridor, primarily within emergent areas immediately adjacent to the watercourse, contain monotypic stands of common reed, Japanese stiltgrass or reed canary grass.

Wetland hydrology is provided by a high groundwater table and multiple persistent spring seeps located throughout the wetland. Additional sources of hydrology include surface water runoff from adjacent uplands and flood flow from Masons Creek, a perennial watercourse that bisects the wetland flowing south to north. Surface rivulets were noted in several areas throughout Survey Area 2 and were a primary focus area, particularly where hummocks, skunk cabbage and sphagnum moss were present.

Most of Study Area 2 lacked the stable hydrologic regime necessary for *Helonias*. One exception is the upper reaches of this study area, approximately 700 feet to 1,200 feet upstream (south) of the runway, where the most suitable swamp pink habitat was identified (See **Figure 4**). This area comprised approximately 2.32 acres composed of rivulets and hummocky areas containing various associate species and was the primary focus of the survey. Visits to search for the species on more than one occasion found no *Helonias* plants. Swamp pink was not found in Survey Area 2, but additional areas beyond the limits of the survey do present suitable habitat.

6.0 Conclusion

Based on the hydrologic conditions, suitable swamp pink habitat was mainly limited to areas between 700 feet and 1,200 feet upstream of the runway, along a series of small rivulets that discharge into Masons Creek. In addition to suitable hydrologic conditions and microtopography, several associate species were observed; however, the plant was not found within the survey area. Based on the observed hydrologic conditions, swamp pink is not believed to occur within the project action area, which extends one mile downstream of the site.

7.0 References

U.S. Fish and Wildlife Service, New Jersey Field Office. 2017. Swamp Pink. <https://www.fws.gov/northeast/njfieldoffice/pdf/swamppinksurvey.pdf >

U.S. Fish and Wildlife Service. Environmental Conservation Online System (ECOS). 2017. Swamp Pink (*Helonias bullata*). <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q2B8>

Appendix A

IPaC Species List and Natural Heritage Program Data Request Results

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
Phone: (609) 646-9310 Fax: (609) 646-0352
http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

In Reply Refer To: October 16, 2017
Consultation Code: 05E2NJ00-2017-SLI-1117
Event Code: 05E2NJ00-2018-E-00166
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species that may occur in your proposed action area and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.)

If the enclosed list indicates that any listed species may be present in your action area, please visit the New Jersey Field Office consultation web page as the next step in evaluating potential project impacts: http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

On the New Jersey Field Office consultation web page you will find:

- habitat descriptions, survey protocols, and recommended best management practices for listed species;
- recommended procedures for submitting information to this office; and
- links to other Federal and State agencies, the Section 7 Consultation Handbook, the Service's wind energy guidelines, communication tower recommendations, the National Bald Eagle Management Guidelines, and other resources and recommendations for protecting wildlife resources.

The enclosed list may change as new information about listed species becomes available. As per Federal regulations at 50 CFR 402.12(e), the enclosed list is only valid for 90 days. Please return to the ECOS-IPaC website at regular intervals during project planning and implementation to obtain an updated species list. When using ECOS-IPaC, be careful about drawing the boundary of your Project Location. Remember that your action area under the ESA is not limited to just the footprint of the project. The action area also includes all areas that may be indirectly affected through impacts such as noise, visual disturbance, erosion, sedimentation, hydrologic change,

chemical exposure, reduced availability or access to food resources, barriers to movement, increased human intrusions or access, and all areas affected by reasonably forseeable future that would not occur without ("but for") the project that is currently being proposed.

We appreciate your concern for threatened and endangered species. The Service encourages Federal and non-Federal project proponents to consider listed, proposed, and candidate species early in the planning process. Feel free to contact this office if you would like more information or assistance evaluating potential project impacts to federally listed species or other wildlife resources. Please include the Consultation Tracking Number in the header of this letter with any correspondence about your project.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

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

This species list is provided by:

New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
(609) 646-9310

Project Summary

Consultation Code: 05E2NJ00-2017-SLI-1117

Event Code: 05E2NJ00-2018-E-00166

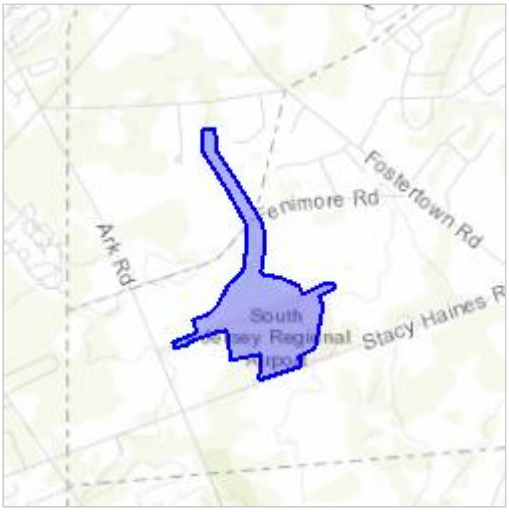
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

Project Type: TRANSPORTATION

Project Description: The Proposed Action involves widening of the runway grade to 60 feet; construction of a partial parallel taxiway south of the runway; and an increase to the runway to taxiway separation to adhere to the FAA design standards.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.946940396065706N74.84572468840386W



Counties: Burlington, NJ

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Bog Turtle *Clemmys muhlenbergii* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

Flowering Plants

NAME	STATUS
Swamp Pink *Helonias bullata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333	Threatened

Critical habitats

There are no critical habitats within your project area under this office's jurisdiction.

USFWS National Wildlife Refuges And Fish Hatcheries

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

There are no refuges or fish hatcheries within your project area.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are USFWS Birds of Conservation Concern that might be affected by activities in this location. The list does not contain every bird you may find in this location, nor is it guaranteed that all of the birds on the list will be found on or near this location. To get a better idea of the specific locations where certain species have been reported and their level of occurrence, please refer to resources such as the E-bird data mapping tool (year-round bird sightings by birders and the general public) and Breeding Bird Survey (relative abundance maps for breeding birds). Although it is important to try to avoid and minimize impacts to all birds, special attention should be given to the birds on the list below. To get a list of all birds potentially present in your project area, visit the E-bird Explore Data Tool.

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Buff-breasted Sandpiper *Tryngites subruficollis* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Black Skimmer *Rynchops niger* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Bobolink *Dolichonyx oryzivorus* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Jul 31
Canada Warbler *Wilsonia canadensis* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Aug 10

Cerulean Warbler *Dendroica cerulea* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/2974	Breeds Aug 20 to Jul 20
Clapper Rail *Rallus longirostris* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8937	Breeds Apr 10 to Oct 31
Dunlin *Calidris alpina arcticola* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Evening Grosbeak *Coccothraustes vespertinus* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Eastern Whip-poor-will *Caprimulgus vociferus* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Aug 20
Gull-billed Tern *Gelochelidon nilotica* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
Golden-winged Warbler *Vermivora chrysoptera* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Kentucky Warbler *Oporornis formosus* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Aug 20
King Rail *Rallus elegans* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Long-eared Owl *asio otus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/3631	Breeds elsewhere
Least Tern *Sterna antillarum* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Sep 10
Lesser Yellowlegs *Tringa flavipes* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler *Dendroica discolor* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* **Bird of Conservation Concern (BCC)**	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus*	Breeds May 10 to Sep 10

Bird of Conservation Concern (BCC)

Red-throated Loon *Gavia stellata* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Saltmarsh Sparrow *Ammodramus caudacutus* — Breeds May 15 to Sep 5
Bird of Conservation Concern (BCC)

Short-billed Dowitcher *Limnodromus griseus* — Breeds elsewhere
Bird of Conservation Concern (BCC)
https://ecos.fws.gov/ecp/species/9480

Semipalmated Sandpiper *Calidris pusilla* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Seaside Sparrow *Ammodramus maritimus* — Breeds May 10 to Aug 20
Bird of Conservation Concern (BCC)

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31
Bird of Conservation Concern (BCC)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeas

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1E
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1C
- PFO1/SS1C
- PSS1B
- PFO1/EM1E
- PSS1C

FRESHWATER POND

- PAB4Hx
- PUBHx
- PUBHh

OTHER

- Pf

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks & Forestry
State Forestry Service
Mail Code 501-04
Office of Natural Lands Management – Natural Heritage Program
P.O. Box 420
Trenton, NJ 08625-0420
Tel. (609) 984-1339 Fax. (609) 984-1427

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

March 30, 2017

Anthony J. Velazquez
AECOM
30 Knightsbridge Road, Suite 520
Piscataway, NJ 08854

Re: South Jersey Regional Airport Phase I Airfield Improvements
Block(s) - 36, Lot(s) - 14
Lumberton Township, Burlington County

Dear Mr. Velazquez:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.1) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Natural Heritage Data Request Form into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

This report does not include information concerning known Northern Long-eared Bat hibernacula and maternity roost trees protected under the provisions of the U.S. Fish & Wildlife Service's 4(d) Rule. You must contact the U.S. Fish & Wildlife Service, New Jersey Field Office, for additional information concerning the location of these features, or visit their website at: http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

We have also checked the Landscape Project habitat mapping and Biotics Database for all occurrences of rare wildlife species or wildlife habitat within one mile of the referenced site. Please refer to Table 3 (attached) to determine if any rare wildlife species or wildlife habitat is documented within one mile of the project site. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on the project site.

NHP File No. 17-3907487-11629

For requests submitted as part of a Flood Hazard Area Control Act (FHACA) rule application, we report records for all rare plant species and ecological communities tracked by the Natural Heritage Program that may be on, or in the immediate vicinity of, your project site. A subset of these plant species are also covered by the FHACA rules when the records are located within one mile of the project site. One mile searches for FHACA plant species will only report precisely located occurrences for those wetland plant species identified under the FHACA regulations as being critically dependent on the watercourse. Please refer to Table 3 (attached) to determine if any precisely located rare wetland plant species covered by the FHACA rules have been documented. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on, or in the immediate vicinity of, the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1, 2 and 3 (attached) to determine if any priority sites are located on, in the immediate vicinity, or within one mile of the project site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive NJ-GeoWeb website at the following URL, http://www.state.nj.us/dep/gis/geowebsplash.htm or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Robert J. Cartica
Administrator

c: NHP File No. 17-3907487-11629

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	**Included**	**Number of Pages**
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	**Included**	**Number of Pages**
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Thursday, March 30, 2017

NHP File No.: 17-3907487-11629

Other Animal Species
In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 3: Within 1 Mile for FHACA Searches (6 possible reports)

Report Name	Included	Number of Pages
1. Rare Plant Species Occurrences Covered by the Flood Hazard Area Control Act Rule Within One Mile of the Project Site Based on Search of Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within 1 mile	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Great Blue Heron	Ardea herodias	Nesting Colony	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1378
Potential vernal habitat area	1388

Total number of records: 2

Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Appendix B

Photograph Display

1. View facing southwest of potential swamp pink habitat in the wooded area adjacent to the aircraft maintenance building.

2. View facing southwest of the mucky substrate area within the potential swamp pink habitat in the wooded area northwest of the aircraft maintenance building.

3. View facing west from the east side of Masons Creek of the mucky substrate area adjacent to Masons Creek.

4. View facing north of the area between Masons Creek and the stormwater management basin.

5. View facing west of Masons Creek near the stormwater management basin outfall.

6. View facing northwest of Masons Creek's culverts from the upstream side of Masons Creek.

7. View facing southwest of the forested area on the upstream side Masons Creek near the culverts.

8. View facing south of Masons Creek upstream of the culverts under Runway 8-26.

9. View facing northwest of the ponded area of Masons Creek's tributary north of Runway 8-26.

10. View facing northwest of Masons Creek's tributary north of Runway 8-26.

11. View facing northeast of the area adjacent to Masons Creek's tributary located to the north of Runway 8-26.

12. View facing southwest of potential vernal habitat located east of Masons Creek downstream of the culverts.

13. View facing northeast of potential vernal habitat located east of Masons Creek near the culverts.

14. View facing northwest of Masons Creek located north of Runway 8-26.

15. View facing south of the pond that is part of Masons Creek's tributary south of Runway 8-26.

16. View facing east of the pond that is part of Masons Creek's tributary south of Runway 8-26.

17. View facing west of Masons Creek's tributary south of Runway 8-26.

18. View facing northwest of the grassed area between Taxiway B and Masons Creek from the west side of the Main Apron.

AECOM

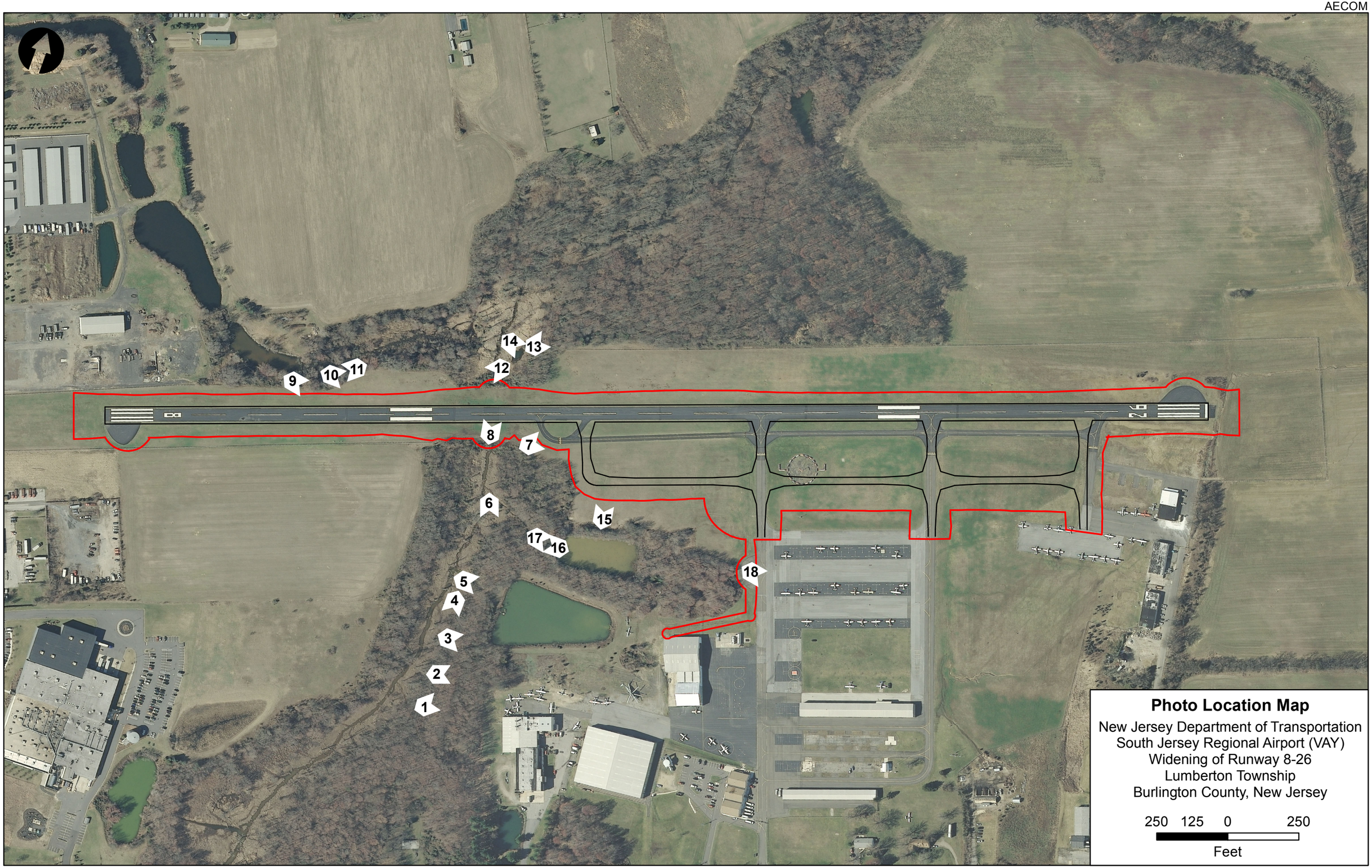


Photo Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

250 125 0 250

Feet

Appendix C

Wetland Delineation Report

(See Appendix E of the EA)

Supplemental Swamp Pink Survey

New Jersey Department of Transportation
South Jersey Regional Airport
Widening of Runway 08-26 and Ancillary Improvements

February 13, 2018

Introduction

As recommended by the U.S. Fish and Wildlife Service, additional swamp pink (*Helonias bullata*) survey was conducted downstream of the project area to determine the presence of the species. The study area for this supplemental survey included wetlands associated with Masons Creek within approximately one-half mile of the runway (**Figure 1**).

Swamp Pink Habitat Requirements

Swamp pink is a shade tolerant perennial plant that occurs in forested freshwater wetlands. The species is mainly found in Atlantic white cedar (*Chamaecyparis thyoides*) bogs and red maple (*Acer rubrum*) swamps. *Helonias* habitat is further characterized as forested headwater wetlands bordering meandering streams. *Sphagnum*-covered hummocks formed by tree and shrub roots provide good habitat for the species, as do small areas of standing water within bogs.

Canopy structure plays an important role in *Helonias* habitat. The canopy must provide ample shade for the species, and restrict the growth of competitive successional species. More significant to the habitat requirements of *Helonias* is the hydrologic conditions. The water table must occur at or near the surface, with minimal seasonal fluctuations or floodwater inundation.

Primary associate species include Atlantic white cedar, red maple, pitch pine (*Pinus rigida*), black gum (*Nyssa sylvatica*), sweetbay magnolia (*Magnolia virginiana*), American holly (*Ilex opaca*), sweet pepperbush (*Clethera alnifolia*), skunk cabbage (*Symplocarpus foetidus*), and sphagnum moss (*Spahgnum* spp.).

Survey Methodology

The survey was conducted by Anthony J. Velazquez on January 26 and 29, 2018. Mr. Velazquez has a B.S. in Environmental Studies from the Richard Stockton College of New Jersey, in addition to over twenty years of professional experience performing and managing a variety of environmental studies. Mr. Velazquez has observed *Helonias* populations in Camden, Cumberland and Cape May Counties.

The survey was characterized by close visual inspection of the ground surface in all areas of suitable habitat. Particular attention was given to hummocky areas adjacent to and between the small streamlets on the site. Despite some leaf litter, the ground surface was reasonably visible in most areas, except where the invasive Japanese stiltgrass (*Microstegium vimineum*) was the dominant groundcover. In spot locations presenting the best habitat, leaf litter was removed by hand to inspect the ground surface beneath.

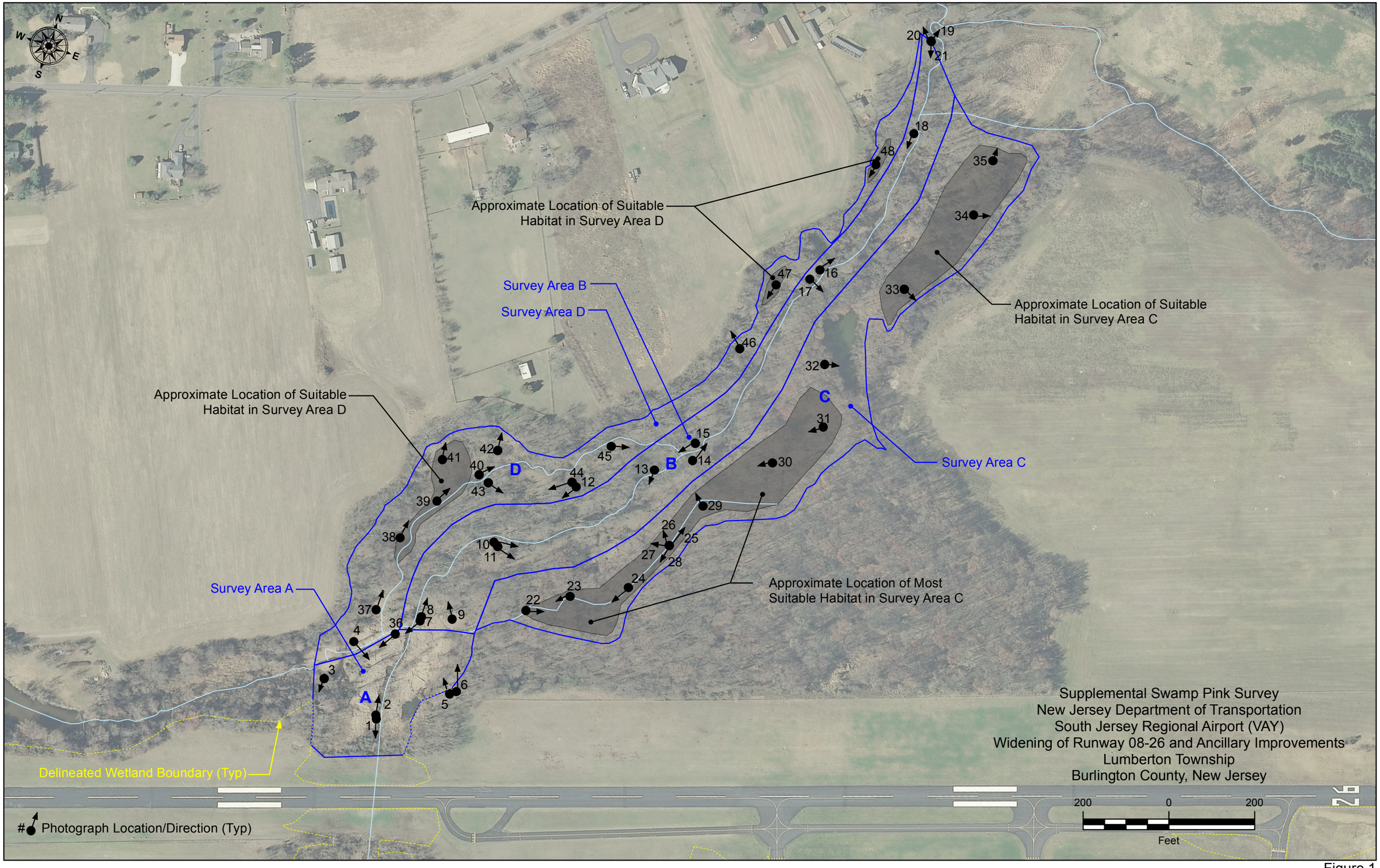

N
W
E
S
Approximate Location of Suitable Habitat in Survey Area D
Survey Area B
Survey Area D
Approximate Location of Suitable Habitat in Survey Area D
Survey Area A
Delineated Wetland Boundary (Typ)
Photograph Location/Direction (Typ)
Approximate Location of Suitable Habitat in Survey Area C
Survey Area C
Approximate Location of Most Suitable Habitat in Survey Area C
A
B
C
D
Supplemental Swamp Pink Survey
New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 08-26 and Ancillary Improvements
Lumberton Township
Burlington County, New Jersey
200
0
200
Feet
26

Figure 1

The overall study area comprises approximately 17.5 acres and generally follows the 100-year floodplain associated with Masons Creek; which, in this particular area, is roughly coterminous with the limits of freshwater wetlands. Four distinct survey areas were identified within the overall study area. Each of these areas exhibits a varying type and degree of anthropogenic alteration, which has affected the topographic conditions, vegetation, crown structure, and/or other natural characteristics.

Approximately 8 hours were spent performing the survey, with a focus on areas presenting the most suitable habitat. Each of the survey areas is discussed below and illustrated in the attached photographic display.

Survey Area A extends from the culvert crossing beneath the runway, downstream along Masons Creek approximately 300 feet. This survey area is approximately two acres and includes a segment of an unnamed tributary flowing easterly into Masons Creek. Survey Area A overlaps a portion of Survey Area 1, which was searched with no plants found as documented in the *Swamp Pink Survey Report* (AECOM, December 2017).

Hydrology in the area is provided by baseflow to the creek, a high groundwater table and multiple persistent spring seeps which occur at slope bases.

Survey Area A has a mostly open canopy punctuated by red maple, black willow (*Salix nigra*), speckled alder (*Alnus incana*), and silky dogwood (*Cornus amomum*). This area has large areas covered with common greenbrier (*Smilax rotundifolia*) and has occasional concentrations of common reed (*Phragmites australis*) and common cattail (*Typha latifolia*). Skunk cabbage (*Symplocarpus foetidus*) occurs throughout the area, but only as a co-dominant along with Japanese stiltgrass, which carpets much of the study area.

In addition to the heavy coverage of invasive species, portions of this area have been graded, filled or otherwise disturbed. Survey Area A has limited areas of marginal habitat, was searched during the initial survey efforts, and was surveyed with less intensity.

Survey Area B comprises approximately five acres and includes the mainstem of Masons Creek and its immediate stream corridor, downstream of Survey Area A. Hydrology is provided by baseflow to Masons Creek, and a series of small channels that discharge into the creek.

This area is mostly forested, but has a relatively open canopy with many clearings—particularly in the up-stream portions. Dominant trees include red maple, silver maple (*Acer saccharinum*) and sweetgum (*Liquidambar styraciflua*). Speckled alder, silky dogwood, and greenbrier dominate the sparse shrub layer, while Japanese stiltgrass and skunk cabbage co-dominate the herbaceous layer.

This area contains heavy invasive species coverage and is also subject to intermittent high intensity flood flows. This area does not provide optimal habitat for *Helonias* and was surveyed with less intensity.

Survey Area C comprises approximately 6.5 acres in the eastern portion of the Masons Creek floodplain. This area contains better *Helonias* habitat than Areas A, B and D.

Hydrology is provided by a high groundwater table and multiple persistent spring seeps which originate along slope bases and create a network of streamlets that drain into Masons Creek. Upland forests border a good portion of Area C, and the area has enough canopy cover to limit the spread of Japanese stiltgrass.

Dominant vegetation includes red maple, silver maple, sweetgum, black cherry (*Prunus serotina*), pin oak (*Quercus palustris*), silky dogwood, musclewood (*Carpinus caroliniana*) and black gum. Dominant shrubs and vines include southern arrowwood (*Viburnum dentatum*), spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), greenbrier and poison ivy (*Toxicodendron radicans*). Herbaceous vegetation includes skunk cabbage, Japanese stiltgrass, sedges (*Carex* spp.), bulrushes (*Scirpus* spp.), sensitive fern (*Onoclea sensibilis*) and cinnamon fern (*Osmunda cinnamomea*).

Survey Area C was surveyed most intensively with particular focus on hummocky areas and areas along small streamlets.

Survey Area D comprises approximately four acres along the western portion of the Masons Creek floodplain. Survey Area D is located in close proximity to agricultural uses which occupy the immediately adjacent upland areas. This survey area does contain pockets of suitable habitat, but lacks the forested buffer, and shows more evidence of disturbance than Survey Area C.

Hydrology is derived from a high groundwater table and multiple persistent spring seeps which originate along slope bases and lead into a small tributary that drains to Masons Creek.

Limited portions of Survey Area D have enough canopy cover to limit the spread of Japanese stiltgrass and a few smaller pockets of marginal habitat were found along the outermost edge of the floodplain. Dominant vegetation includes red maple, sweetgum, pin oak, silky dogwood, and black gum. Dominant shrubs and vines include speckled alder, southern arrowwood, spicebush, winterberry, greenbrier and poison ivy. Herbaceous vegetation includes skunk cabbage, Japanese stiltgrass, sensitive fern and cinnamon fern.

Suitable habitat areas in Survey Area D were surveyed with high intensity, with particular focus on hummocky areas and areas along small streamlets.

<u>Conclusion</u>

Based on the hydrologic conditions and the presence of extensive invasive species coverage, suitable swamp pink habitat was limited to portions of Survey Area C and Survey Area D. Searches of all areas of suitable habitat within these survey areas did not locate any individual swamp pink plants or swamp pink populations.

1. View of Masons Creek facing upstream near culvert crossing. Much of the ground surface in the immediate stream corridor is covered with Japanese stiltgrass, with skunk cabbage as a co-dominant (Survey Area A).

2. View of Masons Creek facing downstream near culvert crossing (Survey Area A).

3. View of marginal habitat area along unnamed tributary to Masons Creek (Survey Area A). Facing south. This area was searched during previous surveys with no plants found.

4. Northwestern portion of Survey Area A, along unnamed tributary to Masons Creek.

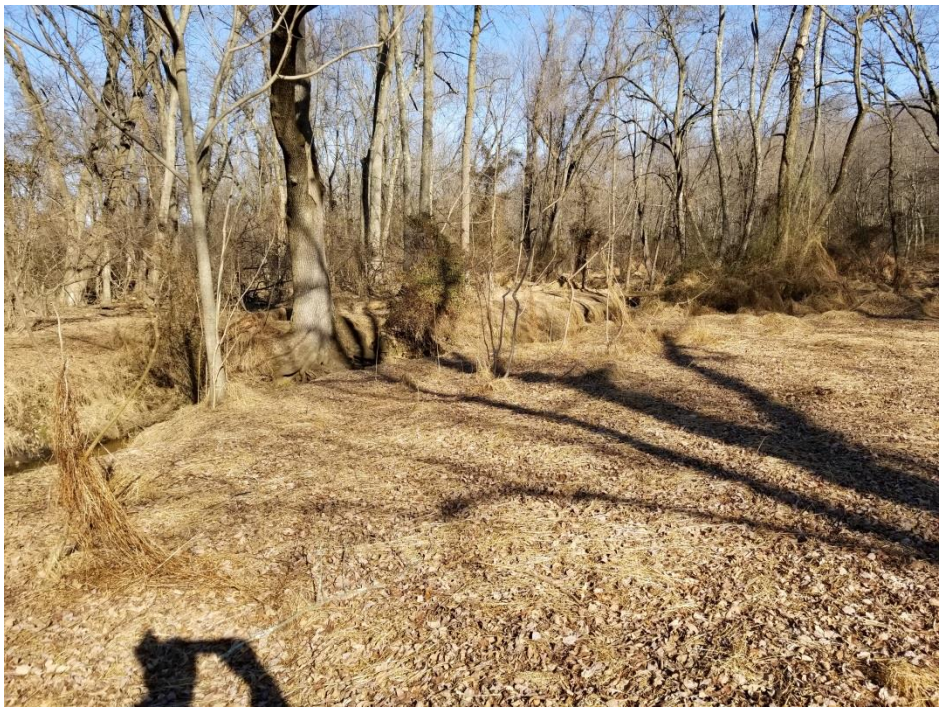
5. Eastern portion of Survey Area A, facing west.

6. Eastern portion of Survey Area A, facing north.

7. Northern portion of Survey Area A at confluence of Masons Creek (foreground and left) and unnamed tributary (right).

8. Southern portion of Survey Area B, facing north (downstream) along Masons Creek.

9. Southern portion of Survey Area B, facing north (downstream) along Masons Creek.



10. Survey Area B. Masons Creek corridor facing north (downstream).

11. Survey Area B. Masons Creek corridor facing east.

12. Facing south-southeast in the area between Survey Areas B and D.

13. Survey Area B, facing south-southwest.

14. Survey Area B, facing north-northeast.

15. Survey Area B, facing south.

16. Survey Area B, facing east towards outflow from a small pond.

17. Survey Area B, facing north-northeast. Note small pond to left and Masons Creek to right.

18. Survey Area B, facing south (upstream) along Masons Creek.

19. Survey Area B, facing north-northwest near limits of survey.

20. Survey Area B, facing east near limits of survey.

21. Survey Area B, facing south near limits of survey.

22. Edge of Survey Area C, facing east with the beginnings of a small streamlet.

23. Survey Area C facing southwest showing hummocky areas subject to intensive searching.

24. Survey Area C facing southwest showing hummocky areas subject to intensive searching.

25. Survey Area C facing north showing a rivulet at the base of slope and hummocky areas (upper left) which were subject to intensive searching.

26. Survey Area C facing west showing a rivulet at the base of slope and hummocky areas which were subject to intensive searching. Note light brown vegetation in background is Japanese stiltgrass—which is part of Survey Area B.

27. Survey Area C facing west-southwest showing hummocky areas which were subject to intensive searching.

28. Survey Area C facing south showing hummocky areas which were subject to intensive searching.

29. Central portion of Survey Area C facing north-northwest showing a series of small streamlets and hummocky areas which were subject to intensive searching.

30. Central portion of Survey Area C facing west showing a small streamlet and hummocky areas which were subject to intensive searching.

31. Central portion of Survey Area C facing west showing a small streamlet which drains to Masons Creek.

32. Small pond located in Survey Area C facing east.

33. Northern portion of Survey Area C, facing east. This area has more open canopy and increased presence of invasive species compared to the southern and central portions of Survey Area C.

34. Northern portion of Survey Area C, facing east. This area has more open canopy and increased presence of invasive species compared to the southern and central portions of Survey Area C.

35. Northern portion of Survey Area C, facing east. This area has more open canopy and increased presence of invasive species compared to the southern and central portions of Survey Area C.

36. Survey Area D facing west along unnamed tributary to Masons Creek.

37. Survey Area D facing north along a small headwater tributary that discharges into an unnamed tributary to Masons Creek.

38. Survey Area D facing north along a small headwater tributary that discharges into an unnamed tributary to Masons Creek.

39. Survey Area D facing north along a small headwater tributary that discharges into an unnamed tributary to Masons Creek.

40. Survey Area D facing north-northeast along a small headwater tributary that discharges into an unnamed tributary to Masons Creek.

41. Slope base seeps and hummocky areas of Survey Area D, facing north. These areas were searched with high intensity.

42. Hummocky areas of Survey Area D, facing north. Note prevalence of Japanese stiltgrass.

43. Survey Area D, facing east-southeast. Note prevalence of Japanese stiltgrass.

44. Survey Area D, facing west along unnamed tributary to Masons Creek. Note prevalence of Japanese stiltgrass.

45. Survey Area D, facing east along unnamed tributary to Masons Creek. Note prevalence of Japanese stiltgrass.

46. Survey Area D, facing northwest towards agricultural fields. Note prevalence of Japanese stiltgrass.

47. Survey Area D, facing west showing marginal habitat areas with some hummocky areas.

48. Survey Area D, facing west showing marginal habitat areas with some hummocky areas.

AECOM

South Jersey Regional Airport
Phase 1 Bog Turtle Survey Report

Widening of Runway 8-26 and Ancillary Improvements
Lumberton Township, Burlington County

November 22, 2017

Prepared for:

New Jersey Department of Transportation
1035 Parkway Avenue
Trenton, NJ 08625

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Appendix B Bog Turtle Habitat Evaluation Field Forms
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Appendix D Wetland Delineation Report

1.0 Project Description

The New Jersey Department of Transportation (NJDOT) is proposing airfield safety improvements at South Jersey Regional Airport in coordination with the Federal Aviation Administration (FAA), the lead federal agency. The airport is located along Stacy Haines Road in Lumberton Township, Burlington County, New Jersey. The Project is located on the United States Geological Survey (USGS) Mount Holly NJ 7.5-minute topographical quadrangle. Neighboring townships include Hainesport to the north, Medford to south and Mount Laurel to the west (**Figure 1**).

In order to maintain safe and efficient airport operations, the NJDOT proposes to modify Runway 8-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). The Proposed Action would not increase the capacity or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways.

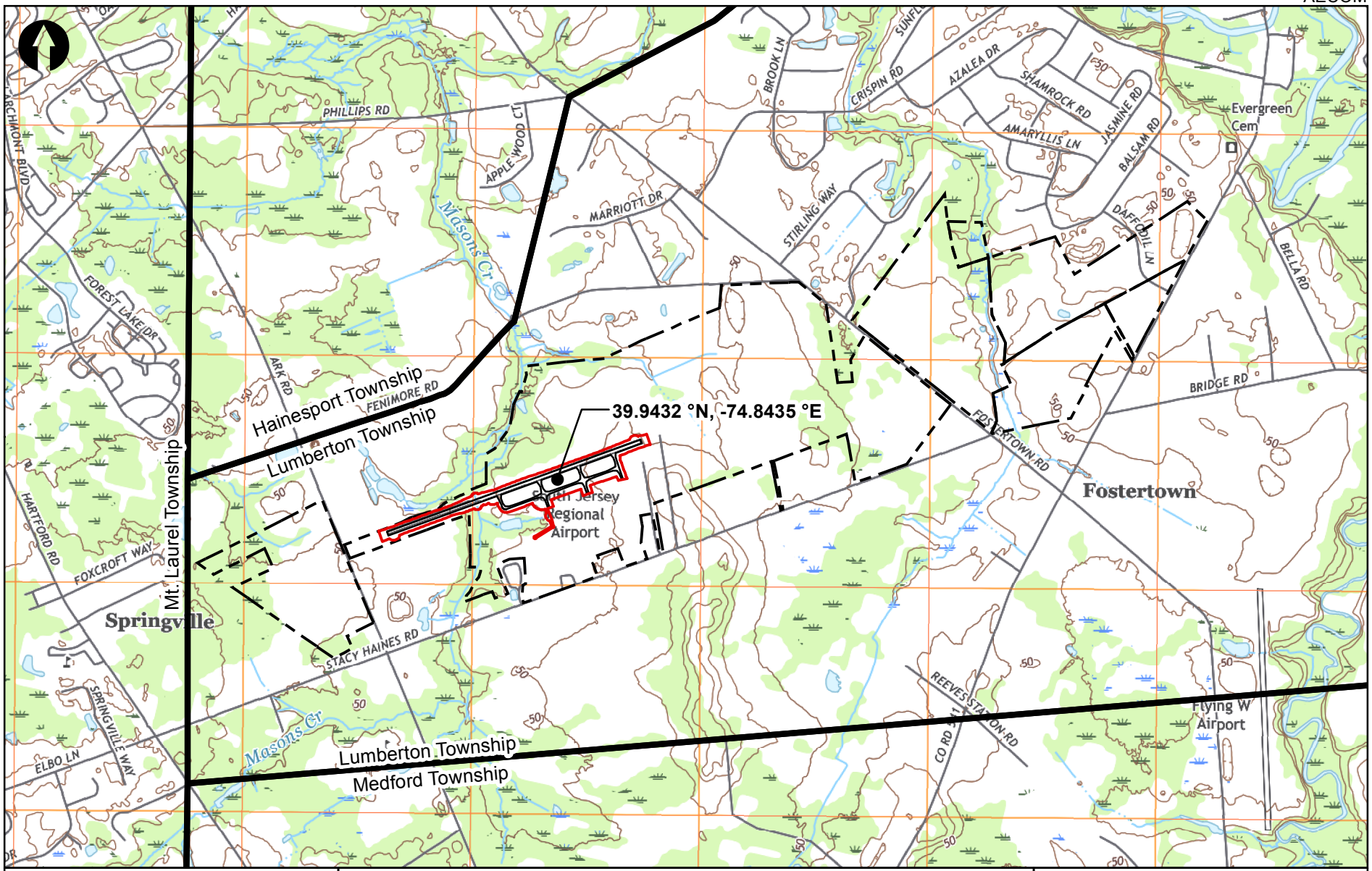
The major elements of the project include:

- Widen Runway 8-26 from 50 feet to 60 feet
- Regrade Runway 8-26 and the surrounding Runway Safety Area (RSA)
- Provide turf shoulders along the runway and turf blast pads at each end
- Clear the surrounding Runway Object Free Area (ROFA) including tree removal to the degree practicable
- Relocate and widen parallel Taxiway “A” from approximately 20 feet to 35 feet, and extend the connecting taxiways
- Relocate the segmented circle and wind cone

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing culvert crossing of Masons Creek with a three-sided rigid frame structure. The new bridge structure will incorporate channel restoration and stabilization of Masons Creek.
- Demolition/removal of existing Taxiway “A” pavement
- Runway/taxiway lighting and markings
- Trenching for buried utilities

The locations of these key project features are shown in **Figure 2**.



Legend

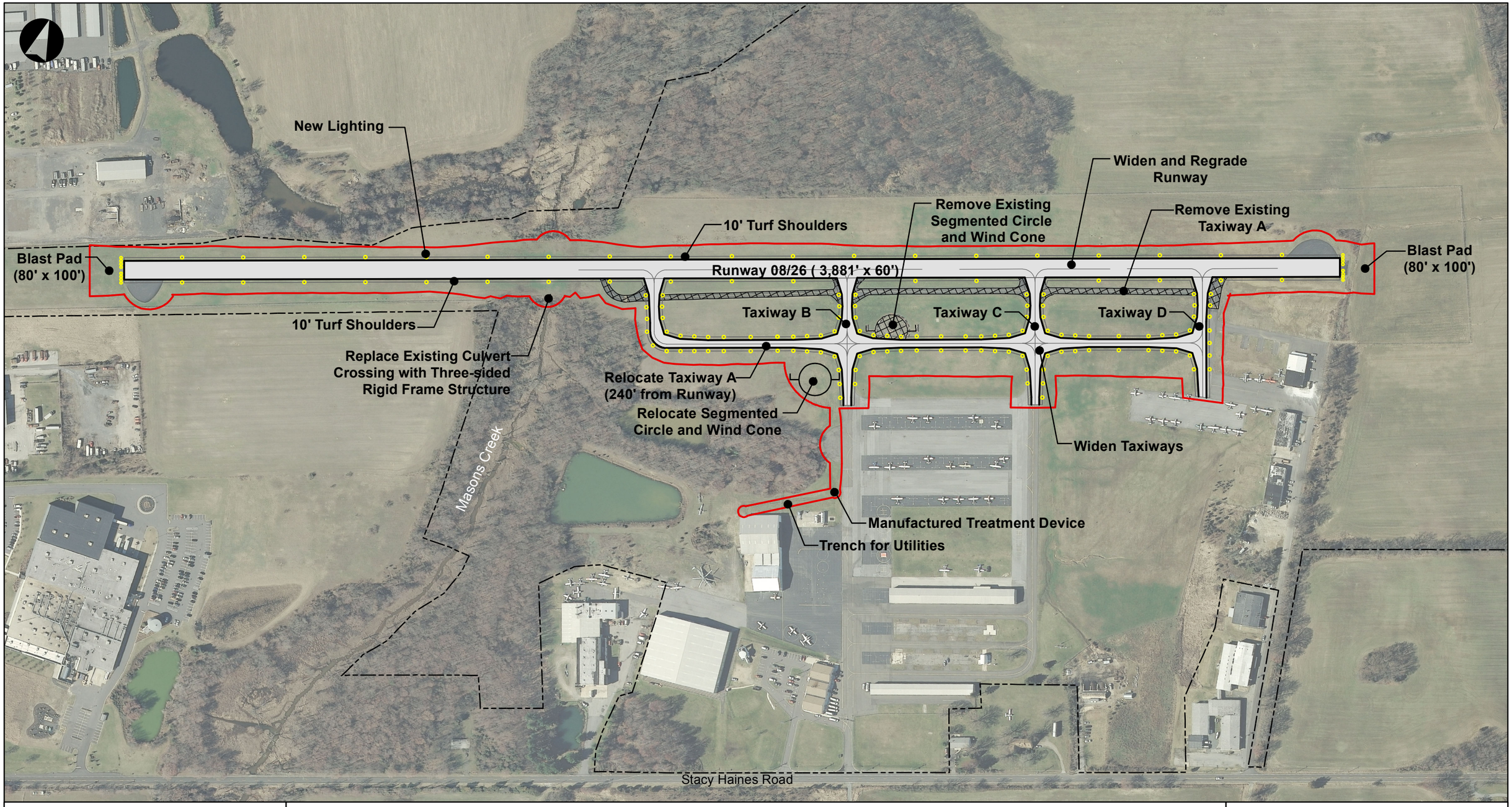
- Project Area
- Airport Property

Project Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USGS Mount Holly US Topographic 7.5' quadrangle

Figure 1



300 150 0 300
Feet

Legend

- Project Area
- Airport Property

Proposed Improvements

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 2

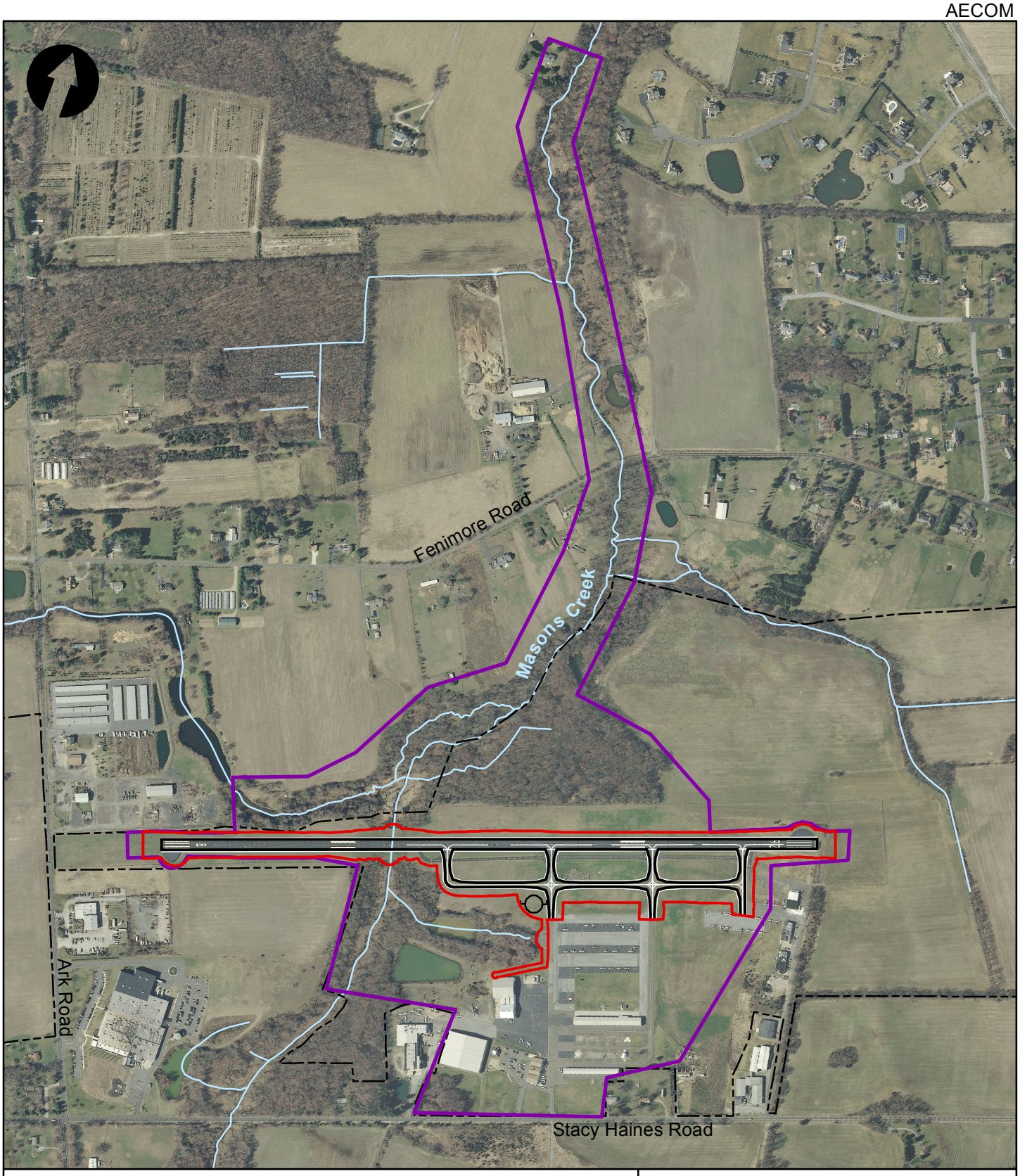
2.0 Purpose and Scope of Study

To initiate project consultation in accordance with U.S. Fish and Wildlife Service (USFWS) New Jersey Field Office guidelines, the "action area" for the study area was delineated (**Figure 3**). The action area generally includes the project limits of disturbance (LOD) and immediate surrounding areas, wetlands and waterways down-gradient of the proposed construction, and downstream areas within one mile. The Information, Planning, and Conservation (IPaC) system was utilized to obtain a species list for the action area, which identified bog turtle (*Clemmys muhlenbergii*) amongst other federally listed species. Bog turtle is a federally listed threatened species and a New Jersey state endangered species. Searches of the New Jersey Landscape Project habitat mapping (Version 3.3), as well as the New Jersey Natural Heritage Program (NHP) Database for records of rare or endangered species and natural communities on or near the project site did not identify bog turtle. Copies of the IPaC list and NHP data request response have been included in **Appendix A**.

The Preferred Alternative is the subject of an Environmental Assessment (EA), which is being prepared pursuant to the National Environmental Policy Act of 1969 (NEPA). This report has been prepared to document field activities performed to determine whether or not wetland areas on the site are potential bog turtle habitat, and to support consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA – 16 U.S.C. 1531-1544, 87 Stat. 884, as amended).

3.0 Bog Turtle Habitat Requirements

The known range of the bog turtle in New Jersey includes; Burlington, Gloucester, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Somerset, Sussex, Union, and Warren, counties (USFWS 2006). Potential bog turtle habitat is recognized by three criteria: suitable hydrology, including spring seeps, shallow surface water, persistently saturated soils, subsurface flow, and rivulets, suitable soil conditions, including a bottom substrate of soft muck, a critical criterion and suitable vegetative structure, including dominant vegetation of low grasses, rushes (*Carex* spp.), bulrushes (*Scirpus* spp.) tussock sedge (*Carex stricta*), other sedge species (*Cyperus* spp., *Dulichium* spp.), as well as cattail (*Typha latifolia*), rice cut-grass (*Leersia oryzoides*), arrow-leaved tearthumb (*Polygonum sagittatum*), spotted jewelweed (*Impatiens capensis*), alders (*Alnus* spp.), skunk cabbage (*Symplocarpus foetidus*) and other scrub-shrub and open canopy wetland species.



800 400 0 800

Feet

Legend

- Project Area
- Airport Property
- Project Action Area

Project Action Area

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 3

4.0 Survey Methodology

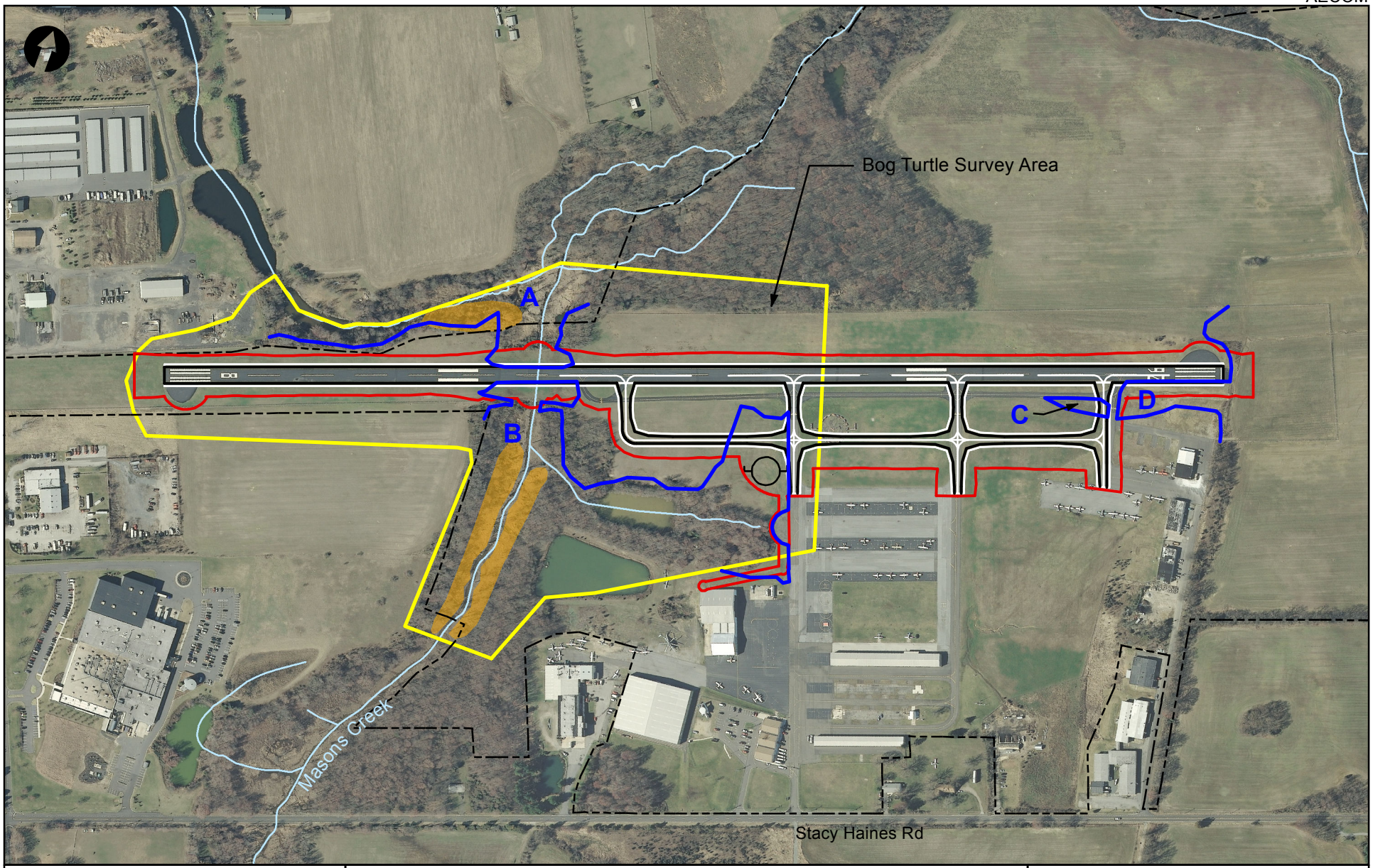
The Phase 1 bog turtle survey was conducted on March 9, 2017 by Bridger Thompson (a USFWS recognized, qualified bog turtle surveyor in New Jersey, Pennsylvania, Delaware, Maryland and New York) with assistance from Nathan Jones (biologist and listed assistant in Mr. Thompson's PA Fish and Boat Commission Scientific Collectors Permit) and Anthony Velazquez (wetland scientist). The Phase 1 survey conformed to the survey methodology outlined in the USFWS *Guidelines for Bog Turtle Surveys* (Revised April 2006). The Phase 1 Study Area included the anticipated project limits of disturbance as well as all wetland areas within a minimum of 300 feet (**Figure 4**). Wetlands within the Study Area were not formally delineated at the time of the Phase 1 bog turtle survey; however, best professional judgment was utilized to identify wetland areas for the purposes of the survey. The investigation was conservatively extended beyond the Study Area limits to the extent possible, but investigations were limited by the airport property boundaries. Information recorded during the Phase 1 bog turtle survey for each wetland is presented on the USFWS/PFBC Bog Turtle Habitat Evaluation Field Forms, including dominant plant species, substrate characteristics, and hydrology (**Appendix B**). Representative habitat conditions within the wetlands were photographed, which are included in the attached photo log (**Appendix C**).

5.0 Survey Results

During AECOM's Phase 1 bog turtle survey, three wetland areas were identified within the Study Area. These wetland areas are described below, along with a discussion of their suitability to be considered potential bog turtle habitat. A copy of the *Wetland Delineation Report* (AECOM, June 2017) has been included in **Appendix D**.

5.1 Wetland Area A (POW/PEM/PSS/PFO/Pf)

Wetland Area A contains palustrine open water (POW), palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO) and palustrine farmed (Pf) components associated with Masons Creek and an unnamed tributary to Masons Creek which closely parallels the airport property to the north of Runway 8-26. This wetland encompasses approximately 4.8 acres within the Study Area and extends beyond the Study Area along a series of manmade ponds. The PEM, PSS and PFO portions of the wetland on the south (i.e., airport) side of the ponds were able to be investigated for bog turtle habitat. The vegetative structure throughout the PEM portion of the wetland was dominated by species commonly found in potential bog turtle habitat including skunk cabbage, reed canary grass (*Phalaris arundinacea*), rushes, and sedges, with pockets dominated by common reed (*Phragmites australis*). The wetland fringes were mainly PSS cover type and were dominated by silky dogwood (*Cornus amomum*), arrowwood viburnum (*Viburnum dentatum*) and winterberry (*Ilex verticillata*). Up-slope of the PSS wetlands, forested wetlands (PFO) and modified agricultural wetlands (Pf) occur. The PFO wetlands are dominated by red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), and sweetgum (*Liquidambar styraciflua*). The Pf wetlands contain vegetation essentially the same as other, non-wetland lawn areas on the airport property and



500 0 500

Feet

Legend

- Project Area
- Airport Property
- Bog Turtle Survey Area
- Spring Fed Mucky Substrate
- Delineated Wetlands

Habitat Survey Location

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS and Field Investigations March 2017

Figure 4

contain various lawn grasses, including tall fescue (*Festuca arundinacea*), ryegrass (*Lolium spp*.), and Kentucky bluegrass (*Poa pratensis*), and a host of forbs such as common dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), English plantain (*Plantago lanceolata*), wild onion (*Allium vineale*), common clover (*Trifolium repens*), chickweed (*Stellaria media*), and others.

Wetland hydrology was provided by a high groundwater table and multiple persistent spring seeps located throughout the wetland. Additional sources of hydrology included surface water runoff from adjacent uplands, and overflow from the manmade ponds. Review of aerial imagery and onsite inspections indicate the wetland hydrology has been affected by the manmade ponds that were constructed prior to 1970 (historic aerials.com); however, the remaining spring seep hydrology creates areas with deep muck substrate, and surface rivulets with muck substrate observed to depths of greater than ten inches. **Due to the presence of appropriate vegetative structure, sufficient depth of muck soils and spring fed hydrology, Wetland Area A was considered potential bog turtle habitat. Approximately 1.2 acres of possible direct survey area (DSA) was identified within the Study Area. Based on evaluation of aerial photography, no additional DSA is located outside the Study Area.**

5.2 Wetland Area B (POW/PEM/PSS/PFO/Pf)

Wetland Area B contains palustrine open water (POW), palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO) and palustrine farmed (Pf) components associated with Masons Creek to the south of Runway 8-26. This wetland encompasses approximately 3.7 acres within the Study Area and extends southwest beyond the Study Area, beyond the property boundary and upstream past the Stacy Haines Road bridge. The estimated total wetland acreage is 14 acres. The vegetative structure throughout the PEM portion of the wetland was dominated by species commonly found in potential bog turtle habitat including; reed canary grass, rushes, sedges and skunk cabbage, with pockets dominated by common reed. The wetland fringes were predominantly PSS cover type and were dominated by silky dogwood, arrowwood viburnum and speckled alder (*Alnus incana*). Up-slope of the PSS wetlands, PFO and Pf occur. The PFO wetlands are mainly dominated by red maple and sweetgum, while the Pf wetlands contain lawn grasses and weeds as described above.

A portion of this wetland connects to a manmade stormwater management basin located between the main wetland area and the airport main apron. Wetland hydrology was provided by a high groundwater table and multiple persistent spring seeps located throughout the wetland. Additional sources of hydrology included surface water runoff from adjacent uplands, and flood flow from Masons Creek, a perennial watercourse that bisects the wetland flowing south to north. Review of aerial imagery and onsite inspections indicate the wetland hydrology was recently affected by beaver activity that partially closed off culverts which convey Masons Creek under Runway 8-26. This wetland contains areas of deep muck substrate (observed to depths of greater than ten inches) with surface rivulets. **Due to the presence of appropriate vegetative structure, sufficient depth of muck soils, and spring fed hydrology, Wetland Area B is considered potential bog turtle habitat. Approximately 1.8 acres of possible DSA was identified within the Study Area. Based on evaluation of aerial imagery, an additional estimated 1.5 acres of DSA is located within the wetland outside the Study Area.**

5.3 Wetland Areas C and D (Pf/PEM)

Wetland C is a Pf area located between Runway 8-26 and Taxiways A and D. This area was not identified as a wetland at the time of the Phase 1 survey because it is a maintained lawn area. This area was subsequently delineated as a wetland via hydric soils delineation; however, it does not contain suitable hydrology, soils or vegetation to be considered potential bog turtle habitat.

Wetland D is located at the eastern end of the runway and includes the lawn area adjacent to the eastern runway end and adjacent to Taxiway D. The majority of Wetland D is comprised of Pf wetlands in the maintained lawn areas and agricultural field to the east. A small area of PEM wetlands exist along a non-mowed ditch near the runway end. Wetland Area D encompasses approximately one acre within the Study Area.

The vegetative structure throughout the wetland was dominated by soft rush (*Juncus effusus*), sedges and low-growing grasses and forbs, but the area does not display the vegetative characteristics typically found in potential bog turtle habitat. Wetland hydrology is provided by a seasonal high groundwater table and surface water runoff from adjacent lawn and runway and infield areas. No spring fed hydrology or mucky substrate was observed in the wetland. Due to the lack of appropriate vegetative structure, muck soils, and spring fed hydrology, Wetland Area D was not considered potential bog turtle habitat.

6.0 Conclusion

During the Phase I bog turtle habitat assessment performed in March of 2017, two wetlands within the Study Area were investigated for potential bog turtle habitat. Additional modified agricultural wetlands were subsequently delineated, but clearly do not contain suitable hydrology, soils or vegetation to be considered potential bog turtle habitat.

Two wetland areas, Wetlands A and B, were determined to be potential bog turtle habitat. In coordination with the USFWS, efforts will be made to avoid and minimize impacts to these wetlands and impacts to potential habitat areas.

7.0 References

US Fish and Wildlife Service, Guidelines for Bog Turtle Surveys, Revised April 2006.

US Fish and Wildlife Service, New Jersey Field Office. 2017. Bog Turtle. <https://www.fws.gov/northeast/njfieldoffice/endangered/bogturtle.html>

US Fish and Wildlife Service. Environmental Conservation Online System (ECOS). 2017. Bog turtle (*Clemmys muhlenbergii*). <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=C048>

Appendix A

IPaC Species List and Natural Heritage Program Data Request Results

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
Phone: (609) 646-9310 Fax: (609) 646-0352
http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

In Reply Refer To: October 16, 2017
Consultation Code: 05E2NJ00-2017-SLI-1117
Event Code: 05E2NJ00-2018-E-00166
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species that may occur in your proposed action area and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.)

If the enclosed list indicates that any listed species may be present in your action area, please visit the New Jersey Field Office consultation web page as the next step in evaluating potential project impacts: http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

On the New Jersey Field Office consultation web page you will find:

- habitat descriptions, survey protocols, and recommended best management practices for listed species;
- recommended procedures for submitting information to this office; and
- links to other Federal and State agencies, the Section 7 Consultation Handbook, the Service's wind energy guidelines, communication tower recommendations, the National Bald Eagle Management Guidelines, and other resources and recommendations for protecting wildlife resources.

The enclosed list may change as new information about listed species becomes available. As per Federal regulations at 50 CFR 402.12(e), the enclosed list is only valid for 90 days. Please return to the ECOS-IPaC website at regular intervals during project planning and implementation to obtain an updated species list. When using ECOS-IPaC, be careful about drawing the boundary of your Project Location. Remember that your action area under the ESA is not limited to just the footprint of the project. The action area also includes all areas that may be indirectly affected through impacts such as noise, visual disturbance, erosion, sedimentation, hydrologic change,

chemical exposure, reduced availability or access to food resources, barriers to movement, increased human intrusions or access, and all areas affected by reasonably forseeable future that would not occur without ("but for") the project that is currently being proposed.

We appreciate your concern for threatened and endangered species. The Service encourages Federal and non-Federal project proponents to consider listed, proposed, and candidate species early in the planning process. Feel free to contact this office if you would like more information or assistance evaluating potential project impacts to federally listed species or other wildlife resources. Please include the Consultation Tracking Number in the header of this letter with any correspondence about your project.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

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

This species list is provided by:

New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
(609) 646-9310

Project Summary

Consultation Code: 05E2NJ00-2017-SLI-1117

Event Code: 05E2NJ00-2018-E-00166

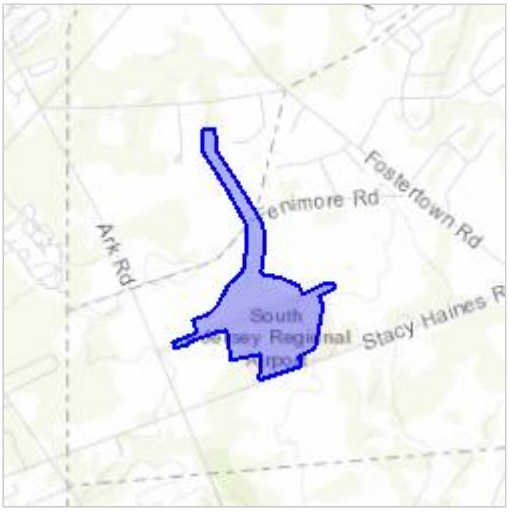
Project Name: South Jersey Regional Airport Phase I Airfield Improvements

Project Type: TRANSPORTATION

Project Description: The Proposed Action involves widening of the runway grade to 60 feet; construction of a partial parallel taxiway south of the runway; and an increase to the runway to taxiway separation to adhere to the FAA design standards.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.946940396065706N74.84572468840386W



Counties: Burlington, NJ

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Bog Turtle *Clemmys muhlenbergii* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

Flowering Plants

NAME	STATUS
Swamp Pink *Helonias bullata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333	Threatened

Critical habitats

There are no critical habitats within your project area under this office's jurisdiction.

USFWS National Wildlife Refuges And Fish Hatcheries

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

There are no refuges or fish hatcheries within your project area.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are USFWS Birds of Conservation Concern that might be affected by activities in this location. The list does not contain every bird you may find in this location, nor is it guaranteed that all of the birds on the list will be found on or near this location. To get a better idea of the specific locations where certain species have been reported and their level of occurrence, please refer to resources such as the E-bird data mapping tool (year-round bird sightings by birders and the general public) and Breeding Bird Survey (relative abundance maps for breeding birds). Although it is important to try to avoid and minimize impacts to all birds, special attention should be given to the birds on the list below. To get a list of all birds potentially present in your project area, visit the E-bird Explore Data Tool.

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Buff-breasted Sandpiper *Tryngites subruficollis* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Black Skimmer *Rynchops niger* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Bobolink *Dolichonyx oryzivorus* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Jul 31
Canada Warbler *Wilsonia canadensis* **Bird of Conservation Concern (BCC)**	Breeds May 20 to Aug 10

Cerulean Warbler *Dendroica cerulea* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/2974	Breeds Aug 20 to Jul 20
Clapper Rail *Rallus longirostris* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8937	Breeds Apr 10 to Oct 31
Dunlin *Calidris alpina arcticola* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Evening Grosbeak *Coccothraustes vespertinus* **Bird of Conservation Concern (BCC)**	Breeds elsewhere
Eastern Whip-poor-will *Caprimulgus vociferus* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Aug 20
Gull-billed Tern *Gelochelidon nilotica* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
Golden-winged Warbler *Vermivora chrysoptera* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Kentucky Warbler *Oporornis formosus* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Aug 20
King Rail *Rallus elegans* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Long-eared Owl *asio otus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/3631	Breeds elsewhere
Least Tern *Sterna antillarum* **Bird of Conservation Concern (BCC)**	Breeds Apr 20 to Sep 10
Lesser Yellowlegs *Tringa flavipes* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler *Dendroica discolor* **Bird of Conservation Concern (BCC)**	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* **Bird of Conservation Concern (BCC)**	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus*	Breeds May 10 to Sep 10

Bird of Conservation Concern (BCC)

Red-throated Loon *Gavia stellata* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Saltmarsh Sparrow *Ammodramus caudacutus* — Breeds May 15 to Sep 5
Bird of Conservation Concern (BCC)

Short-billed Dowitcher *Limnodromus griseus* — Breeds elsewhere
Bird of Conservation Concern (BCC)
https://ecos.fws.gov/ecp/species/9480

Semipalmated Sandpiper *Calidris pusilla* — Breeds elsewhere
Bird of Conservation Concern (BCC)

Seaside Sparrow *Ammodramus maritimus* — Breeds May 10 to Aug 20
Bird of Conservation Concern (BCC)

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31
Bird of Conservation Concern (BCC)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeas

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1E
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1C
- PFO1/SS1C
- PSS1B
- PFO1/EM1E
- PSS1C

FRESHWATER POND

- PAB4Hx
- PUBHx
- PUBHh

OTHER

- Pf

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks & Forestry
State Forestry Service
Mail Code 501-04
Office of Natural Lands Management – Natural Heritage Program
P.O. Box 420
Trenton, NJ 08625-0420
Tel. (609) 984-1339 Fax. (609) 984-1427

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

March 30, 2017

Anthony J. Velazquez
AECOM
30 Knightsbridge Road, Suite 520
Piscataway, NJ 08854

Re: South Jersey Regional Airport Phase I Airfield Improvements
Block(s) - 36, Lot(s) - 14
Lumberton Township, Burlington County

Dear Mr. Velazquez:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.1) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Natural Heritage Data Request Form into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

This report does not include information concerning known Northern Long-eared Bat hibernacula and maternity roost trees protected under the provisions of the U.S. Fish & Wildlife Service's 4(d) Rule. You must contact the U.S. Fish & Wildlife Service, New Jersey Field Office, for additional information concerning the location of these features, or visit their website at: http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

We have also checked the Landscape Project habitat mapping and Biotics Database for all occurrences of rare wildlife species or wildlife habitat within one mile of the referenced site. Please refer to Table 3 (attached) to determine if any rare wildlife species or wildlife habitat is documented within one mile of the project site. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on the project site.

NHP File No. 17-3907487-11629

For requests submitted as part of a Flood Hazard Area Control Act (FHACA) rule application, we report records for all rare plant species and ecological communities tracked by the Natural Heritage Program that may be on, or in the immediate vicinity of, your project site. A subset of these plant species are also covered by the FHACA rules when the records are located within one mile of the project site. One mile searches for FHACA plant species will only report precisely located occurrences for those wetland plant species identified under the FHACA regulations as being critically dependent on the watercourse. Please refer to Table 3 (attached) to determine if any precisely located rare wetland plant species covered by the FHACA rules have been documented. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on, or in the immediate vicinity of, the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1, 2 and 3 (attached) to determine if any priority sites are located on, in the immediate vicinity, or within one mile of the project site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive NJ-GeoWeb website at the following URL, http://www.state.nj.us/dep/gis/geowebsplash.htm or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Robert J. Cartica
Administrator

c: NHP File No. 17-3907487-11629

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	**Included**	**Number of Pages**
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	**Included**	**Number of Pages**
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1388

Total number of records: 1

Thursday, March 30, 2017

NHP File No.: 17-3907487-11629

Other Animal Species
In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Table 3: Within 1 Mile for FHACA Searches (6 possible reports)

Report Name	Included	Number of Pages
1. Rare Plant Species Occurrences Covered by the Flood Hazard Area Control Act Rule Within One Mile of the Project Site Based on Search of Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within 1 mile	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Stream Habitat File	No	0 pages included
6. Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Great Blue Heron	Ardea herodias	Nesting Colony	2	NA	Special Concern	G5	S3B,S4N
	Upland Sandpiper	Bartramia longicauda	Breeding Sighting	4	NA	State Endangered	G5	S1B,S1N

Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.1

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	1378
Potential vernal habitat area	1388

Total number of records: 2

Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Datana ranaeceps	A Hand-maid Moth			G3G4	S3S4

Total number of records: 2

Appendix B

Bog Turtle Habitat Evaluation Field Forms

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: South Jersey Regional Airport Improvements

Project type: Airport / Transportation

Applicant/Landowner Name: NJ-DOT

County: Burlington Quad: Mount Holly Township/Municipality: Lumberton

~~PNDI #~~ IPaC 05EZNJ00-2017-SLI-02200 Potential conflict with USFWS species? ☒ Y ☐ N

ACTION AREA[2]

Action area size: ≈ 152 ac **Does the Phase 1 survey include all wetlands in the action area?** ☐ Y ☒ N[3]

WETLAND ID: A **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 4.8 estimated **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☒ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.942637 Long -74.849034

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 03/09/17 Time In: 11:00 Time Out: 12:00

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☐ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 50 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☐ all of it ☒ part of it (_____% or 1-2 acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☒ part of it (at least 1-2 acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☐ N ☒ Unknown

If yes, *could* they be potential bog turtle habitat? ☒ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

airport runway, taxiway, infield and facilities, active agriculture, wooded shrubby riparian corridor, wetland, upland

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 50 ☒ PSS 25 ☒ PFO 25 ☐ POW ____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe culverts installed at runway crossing, man made ponds upslope, man made dam

☐ Y ☒ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

_____

Project Name South Jersey Regional Airport *Wetland* A *(con't)*

Hydrology

☒ Y ☐ N Springs or seeps ☒ visible or ☐ likely ? Watercress present? ☐ Yes ☒ No
☐ Y ☒ N Spring houses in or adjacent to wetland?
☒ Y ☐ N Saturated soils present? If yes, year-round? ☒ Likely ☐ Unlikely ☐ Unknown
☒ Y ☐ N Water visible on surface? Check all that apply: ☒ small puddles/depressions (5" deep)
☒ rivulets (5" deep) ☒ larger pools/ponds (+10" deep)
☐ Y ☒ N Evidence of flooding? If yes, describe indicators

Soils Mapping Unit (optional): FmhA+, Fluvaquents, loamy 0-3%.
Field observations confirm mapped type? ☐ YES ☐ NO ☒ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☒ YES ☐ NO	How much of it (PEM) is **mucky**? ☐ <10% ☒ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: 0 to 12"	**Most of the mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☒ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]? ☒ YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☒ 30-49% ☐ 50-70% ☐ >70%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☒ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☒ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: 0 to 12"	**Most of the mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☒ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☒ sedges ☒ rushes ☒ skunk cabbage ☒ cattail ☐ sweet flag ☒ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb ☒ reed canary grass ☒ *Phragmites* ☐ purple loosestrife
☐ alder ☒ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐
Additional dominant species: arrowood

Herptiles
Were any bog turtles observed? ☐ YES[7] ☒ NO If yes, how many? ____
Other herptiles ☐ observed ☐ previously observed: None

Additional Comments/Observations: (use additional sheets if necessary)
wetland extends north outside of study area beyond study limits, area of mucky spring fed hydrology connects to impounded area w/ man made dam.

INVESTIGATOR'S OPINION

☒ YES ☐ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☒ YES ☐ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
☒ YES ☐ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☒ YES ☐ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Bridger Thompson — Investigator's Name (print)
Bridger J. Thompson — Investigator's Signature
03/09/2017 — Date

bridger.thompson@aecom.com 717-609-3301

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: South Jersey Regional Airport Improvements

Project type: Airport / Transportation

Applicant/Landowner Name: NJ-DOT

County: Burlington Quad: Mount Holly Township/Municipality: Lumberton

~~PNDI~~ IPaC # 05E2NJ00-2017-SLI-02200 Potential conflict with USFWS species? ☒Y ☐N

ACTION AREA[2]

Action area size: ≈ 152 ac **Does the Phase 1 survey include all wetlands in the action area?** ☐Y ☒N[3]

WETLAND ID: B **PHOTOS TAKEN:** ☒Yes ☐No **WETLAND SIZE:** 14 estimated **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐< 0.1 acre ☐0.1-0.5 acre ☐>0.5 to <1 acre ☐1-2 acres ☐2-4 acres ☐5+ acres ☒10+ acres

WETLAND LOCATION: Lat 39.941617 Long -74.847354

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 03/09/2017 Time In: 10:00 Time Out: 11:00

Last precipitation: ☐< 24 hours ☒1-7 days ☐> 1 week ☐unknown Drought conditions? ☐Y ☐N ☐Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒some of it – _____ acres or 50 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐none of it ☐all of it ☒part of it (_____% or 1-2 acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐all of it ☒part of it (at least 1-2 acres) ☐none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐Y ☐N ☒ Unknown

If yes, *could* they be potential bog turtle habitat? ☒Y ☐N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

airport runway, taxiway, infield and facilities, active agriculture wooded shrubby riparian corridor, wetland, upland

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒PEM 50 ☒PSS 25 ☒PFO 25 ☐POW ____

☒Y ☐N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe culvert installed at runway crossing, beaver dam drainage from ponds

☐Y ☒N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

_____

Project Name South Jersey Regional Airport *Wetland* B *(con't)*

Hydrology

☒Y ☐N Springs or seeps ☒visible or ☐likely? Watercress present? ☒Yes ☐No
☐Y ☒N Spring houses in or adjacent to wetland?
☒Y ☐N Saturated soils present? If yes, year-round? ☒Likely ☐Unlikely ☐Unknown
☒Y ☐N Water visible on surface? Check all that apply: ☒small puddles/depressions (6" deep)
☒rivulets (6" deep) ☒larger pools/ponds (1/2" deep)
☒Y ☐N Evidence of flooding? If yes, describe indicators beaver dam, drift lines

Soils Mapping Unit (optional): FmhAt, Fluvaquents loamy 0-3%
Field observations confirm mapped type? ☐YES ☐NO ☒Unknown

Soils – PEM Portion of Wetland			
Mucky[4]? ☒YES ☐NO	How much of it (PEM) is **mucky**? ☐<10% ☐10-29% ☒30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: 3 to 10"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☒6-8" ☐9-11" ☐≥12"
Non-mucky[6]? ☒YES ☐NO	How much of it (PEM) is **non-mucky**? ☐<10% ☐10-29% ☒30-49% ☐50-70% ☐>70%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]? ☒YES ☐NO	How much of it is **mucky**? ☐<10% ☒10-29% ☐30-49% ☐50-70% ☐>70%	**Mucky** soils range in depth from: 3 to 10"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐3-5" ☒6-8" ☐9-11" ☐≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☒sedges ☒rushes (☒skunk cabbage) ☒cattail ☐sweet flag ☒jewelweed ☐sphagnum moss
☐sensitive fern ☐rice cutgrass ☐tearthumb (☒reed canary grass) ☒*Phragmites* ☐purple loosestrife
☒alder ☒dogwood ☐red maple ☐willow ☐poison sumac ☐multiflora rose ☐_____
Additional dominant species: arrowwood

Herptiles
Were any bog turtles observed? ☐YES[7] ☒NO If yes, how many? _____
Other herptiles ☐observed ☐previously observed: None

Additional Comments/Observations: (use additional sheets if necessary)
wetland extends south beyond study limits, evidence of recent beaver activity.

INVESTIGATOR'S OPINION

☒YES ☐NO ☐UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☒YES ☐NO ☐UNSURE The soils criterion[8] for bog turtle habitat is met.
☒YES ☐NO ☐UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☒YES ☐NO ☐UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Bridger Thompson — Investigator's Name (print)
Bridger J. Thompson — Investigator's Signature
03/09/17 — Date

bridger.thompson@aecom.com 717-609-3301

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form[1]

(revised 06/01/2006)

Project/Property Name: South Jersey Regional Airport Improvements

Project type: Airport / Transportation

Applicant/Landowner Name: NJ-DOT

County: Burlington Quad: Mount Holly Township/Municipality: Lumberton

~~PNDI~~ IPaC # 05EZNJ-2017-SLI-02200 Potential conflict with USFWS species? ☒ Y ☐ N

ACTION AREA[2]

Action area size: ≈ 152 ac **Does the Phase 1 survey include all wetlands in the action area?** ☐ Y ☒ N[3]

WETLAND ID: C-D **PHOTOS TAKEN:** ☐ Yes ☐ No **WETLAND SIZE:** U/K **acres**

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

☐ < 0.1 acre ☐ 0.1-0.5 acre ☒ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☐ 10+ acres

WETLAND LOCATION: Lat 39.944181 Long -74.840704

(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 03/09/17 Time In: 12:00 Time Out: 13:00

Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☐ N ☐ Unknown

How much of this wetland is located *off-site* (*i.e.*, outside the property boundaries or right-of-way)?

☐ none of it – the entire wetland is within the property boundaries (skip next 2 questions)

☒ some of it – _____ acres or 25 % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

☐ none of it ☐ all of it ☒ part of it (_____% or 1 ac acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)?

☐ all of it ☒ part of it (at least 1 acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☐ N ☒ Unknown

If yes, *could* they be potential bog turtle habitat? ☐ Y ☒ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

airport runway, taxiway, infield, active agriculture

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM 100 ☐ PSS _____ ☐ PFO _____ ☐ POW _____

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

airport runway construction, agricultural practices

☒ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

mowing, agricultural practices

C-D

Project Name South Jersey Regional Airport *Wetland* _____ *(con't)*

Hydrology

☐ Y ☒ N Springs or seeps ☐ visible or ☐ likely ? Watercress present? ☐ Yes ☒ No
☐ Y ☒ N Spring houses in or adjacent to wetland?
☐ Y ☒ N Saturated soils present? If yes, year-round? ☐ Likely ☒ Unlikely ☐ Unknown
☐ Y ☒ N Water visible on surface? Check all that apply: ☐ small puddles/depressions (___" deep)
☐ rivulets (___" deep) ☐ larger pools/ponds (___" deep)
☐ Y ☒ N Evidence of flooding? If yes, describe indicators_____

Soils Mapping Unit (optional): URCLAB Urban land, clayey substratum
Field observations confirm mapped type? ☐ YES ☐ NO ☒ Unknown

Soils – PEM Portion of Wetland			
Mucky[4]*?* ☐ YES ☒ NO	How much of it (PEM) is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: _____ to _____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[6]*?* ☒ YES ☐ NO	How much of it (PEM) is **non-mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☒ >70%		

Soils – PSS and PFO Portions of Wetland			
Mucky[4]*?* ☐ YES ☐ NO	How much of it is **mucky**? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	**Mucky** soils range in depth from: _____ to _____"	**Most** of the **mucky part(s)** of the wetland can be probed[5]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

Wetland Vegetation (characterize the wetland as a whole)
Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

☒ sedges ☒ rushes ☐ skunk cabbage ☐ cattail ☐ sweet flag ☐ jewelweed ☐ sphagnum moss
☐ sensitive fern ☐ rice cutgrass ☐ tearthumb ☐ reed canary grass ☐ *Phragmites* ☐ purple loosestrife
☐ alder ☐ dogwood ☐ red maple ☐ willow ☐ poison sumac ☐ multiflora rose ☐_____
Additional dominant species: (fescue) grasses, forbs

Herptiles
Were any bog turtles observed? ☐ YES[7] ☒ NO If yes, how many? _____
Other herptiles ☐ observed ☐ previously observed: None

Additional Comments/Observations: (use additional sheets if necessary)
wetland is located in maintained area of airport infield
no hydrology no veg structure delineated by soils

INVESTIGATOR'S OPINION

☐ YES ☒ NO ☐ UNSURE The hydrology criterion[8] for bog turtle habitat is met.
☐ YES ☒ NO ☐ UNSURE The soils criterion[8] for bog turtle habitat is met.
☐ YES ☒ NO ☐ UNSURE The vegetation criterion[8] for bog turtle habitat is met.
☐ YES ☒ NO ☐ UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Bridger Thompson — Investigator's Name (print)
Bridger Thompson — Investigator's Signature
03/09/17 — Date

bridger.thompson@aecom.com 717-609-3301

Appendix C

Photograph Display

1. View facing north of the area between Masons Creek and the Stormwater management basin.

2. View facing west of Masons Creek near the stormwater management basin outfall.

3. View facing northwest of Masons Creek's culverts from the upstream side of Masons Creek.

4. View facing southwest of the forested area on the upstream side Masons Creek near the culverts.

5. View facing south of Masons Creek upstream of the culverts under Runway 8-26.

6. View facing northwest of the ponded area of Masons Creek's tributary north of Runway 8-26.

7. View facing northwest of Masons Creek's tributary north of Runway 8-26.

8. View facing northeast of the area adjacent to Masons Creek's tributary located to the north of Runway 8-26.

9. View facing southwest of potential vernal habitat located east of Masons Creek downstream of the culverts.

10. View facing northeast of potential vernal habitat located east of Masons Creek near the culverts.

11. View facing northwest of Masons Creek located north of Runway 8-26.

12. View facing south of the pond that is part of Masons Creek's tributary south of Runway 8-26.

13. View facing east of the pond that is part of Masons Creek's tributary south of Runway 8-26.

14. View facing west of Masons Creek's tributary south of Runway 8-26.

15. View facing northwest of the grassed area between Taxiway B and Masons Creek from the west side of the Main Apron.

16. View facing northeast from Wetland C towards the eastern end of Runway 8-26.

17. View facing east towards Taxiway D of Wetland C adjacent to Taxiway A.

18. View facing north of the eastern end of Runway 8-26.

19. View facing south of the ditch adjacent to the eastern end of Runway 08-26.

20. View facing west of Wetland D from south of the eastern end of Runway 8-26.

AECOM

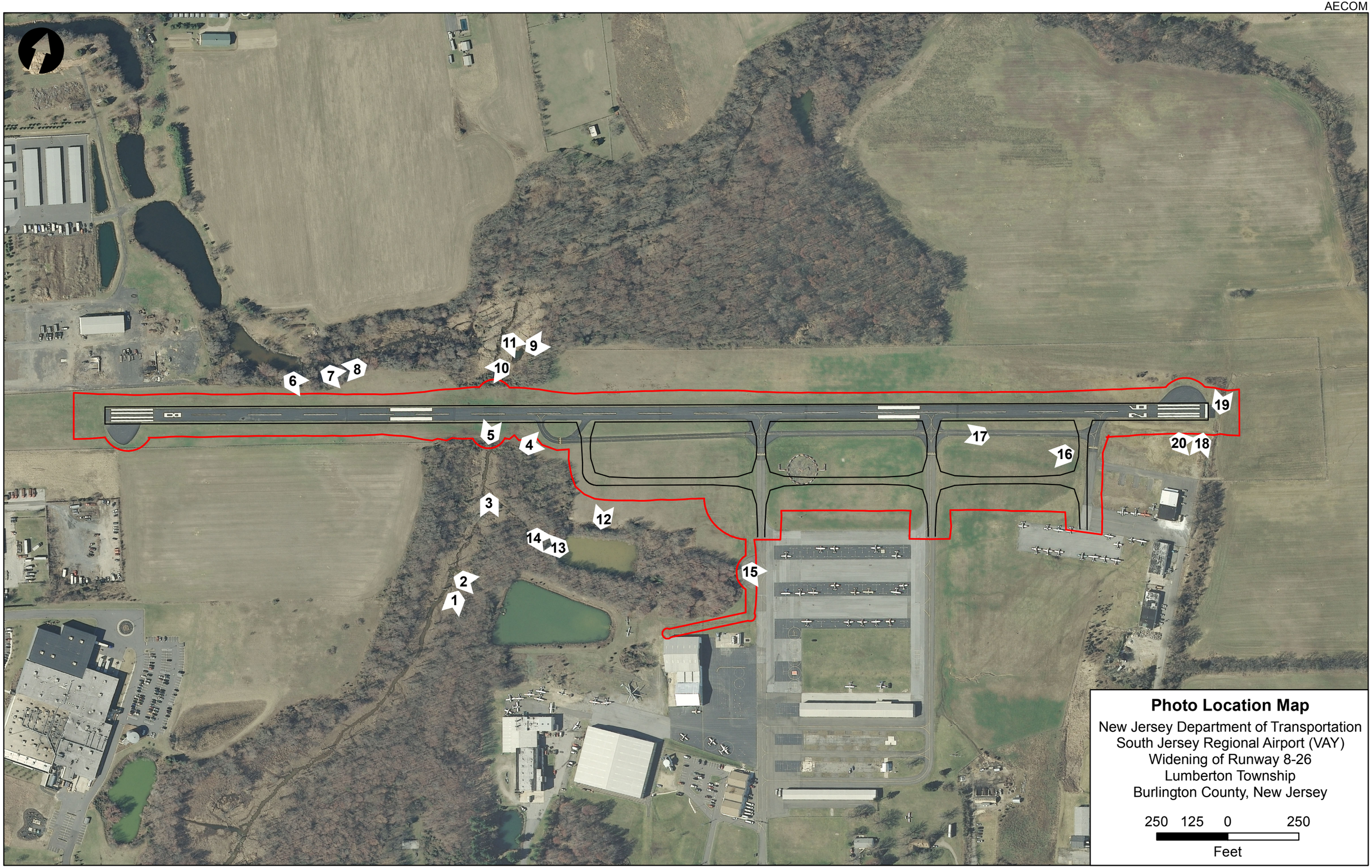

Photo Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

250 125 0 250

Feet

Appendix D

Wetland Delineation Report

(See Appendix E of the EA)

AECOM

South Jersey Regional Airport
Phase 2 Bog Turtle Survey Report

Widening of Runway 08-26 and Ancillary Improvements
Lumberton Township, Burlington County

June 19, 2018

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Table 3 Complete List of Plant Species Observed in Wetland B DSA 2
Table 4 Complete List of Plant Species Observed in Wetland B DSA 3
Table 5 Summary of Other Herpetofauna Observed during Phase 2 Surveys

Appendices:

Appendix A USFWS Correspondence
Appendix B Approved Phase 2 Survey Plan
Appendix C Scientific Collectors Permit
Appendix D Photographs

1.0 Introduction

On behalf of the New Jersey Department of Transportation (NJDOT), AECOM has completed this report to document the results of a Phase 2 bog turtle (Clemmys [Glyptemys] muhlenbergii) survey conducted within two wetland areas adjacent to the proposed South Jersey Regional Airport (VAY) Widening of Runway 08-26 and Ancillary Improvements Project (Project). This work was prompted by the U.S. Fish and Wildlife Service's (USFWS) review of the Phase 1 Bog Turtle Survey Report (AECOM, November 2017), as well as subsequent informal consultation between the USFWS, the Federal Aviation Administration (FAA) and the New Jersey Department of Transportation (NJDOT) (Appendix A).

2.0 Project Description

The NJDOT is proposing airfield safety improvements at South Jersey Regional Airport (VAY) in coordination with the FAA, the lead federal agency. The airport is located along Stacy Haines Road in Lumberton Township, Burlington County, New Jersey. The Project is located on the United States Geological Survey (USGS) Mount Holly NJ 7.5-minute topographical quadrangle. Neighboring townships include Hainesport to the north, Medford to south and Mount Laurel to the west (Figure 1).

In order to maintain safe and efficient airport operations, the NJDOT proposes to modify Runway 08-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). The Proposed Action would not increase the capacity or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways (Figure 2).

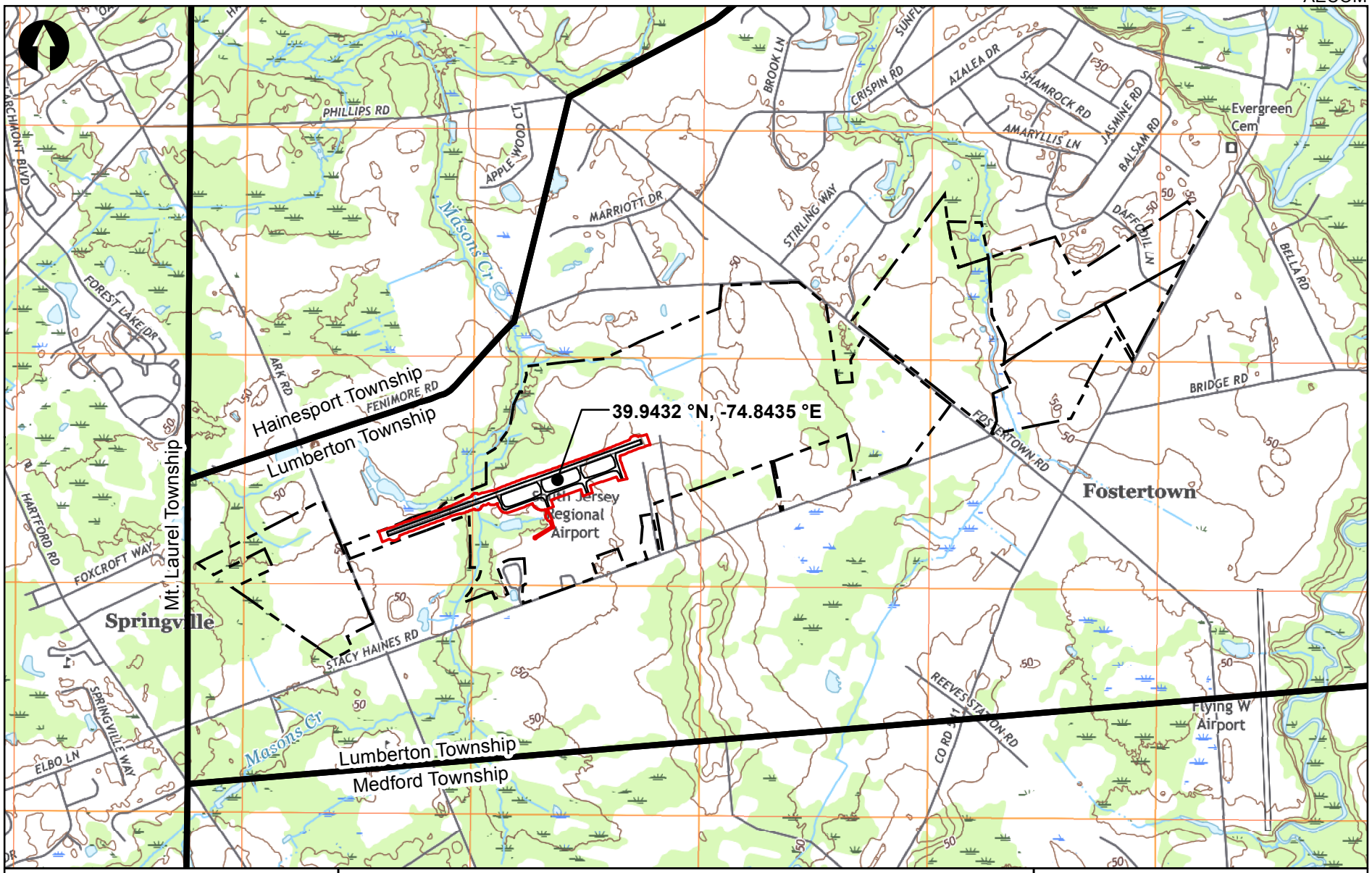
The major elements of the project include:

- Widen Runway 08-26 from 50' to 60'
- Regrade Runway 08-26 and the surrounding Runway Safety Area (RSA)
- Provide 10' turf shoulders along the runway and 15' turf shoulders along the taxiway
- Clear the surrounding runway Object Free Area (OFA) including tree removal to the degree practicable
- Widen parallel taxiway "A" from approximately 20' to 35' and extend the connecting taxiways
- Relocate taxiway "A" centerline 240' off the runway centerline
- Relocate the segmented circle and wind cone

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing (five, 48" CMPs) culvert crossing of Masons Creek with a three-sided rigid frame structure
- Runway/taxiway lighting and markings
- Trenching for buried utilities

The project would not lengthen the existing runway or otherwise have the effect of increasing the number or type of aircraft operations. There are no proposed changes to the FAA's airspace procedures or navigational aids.

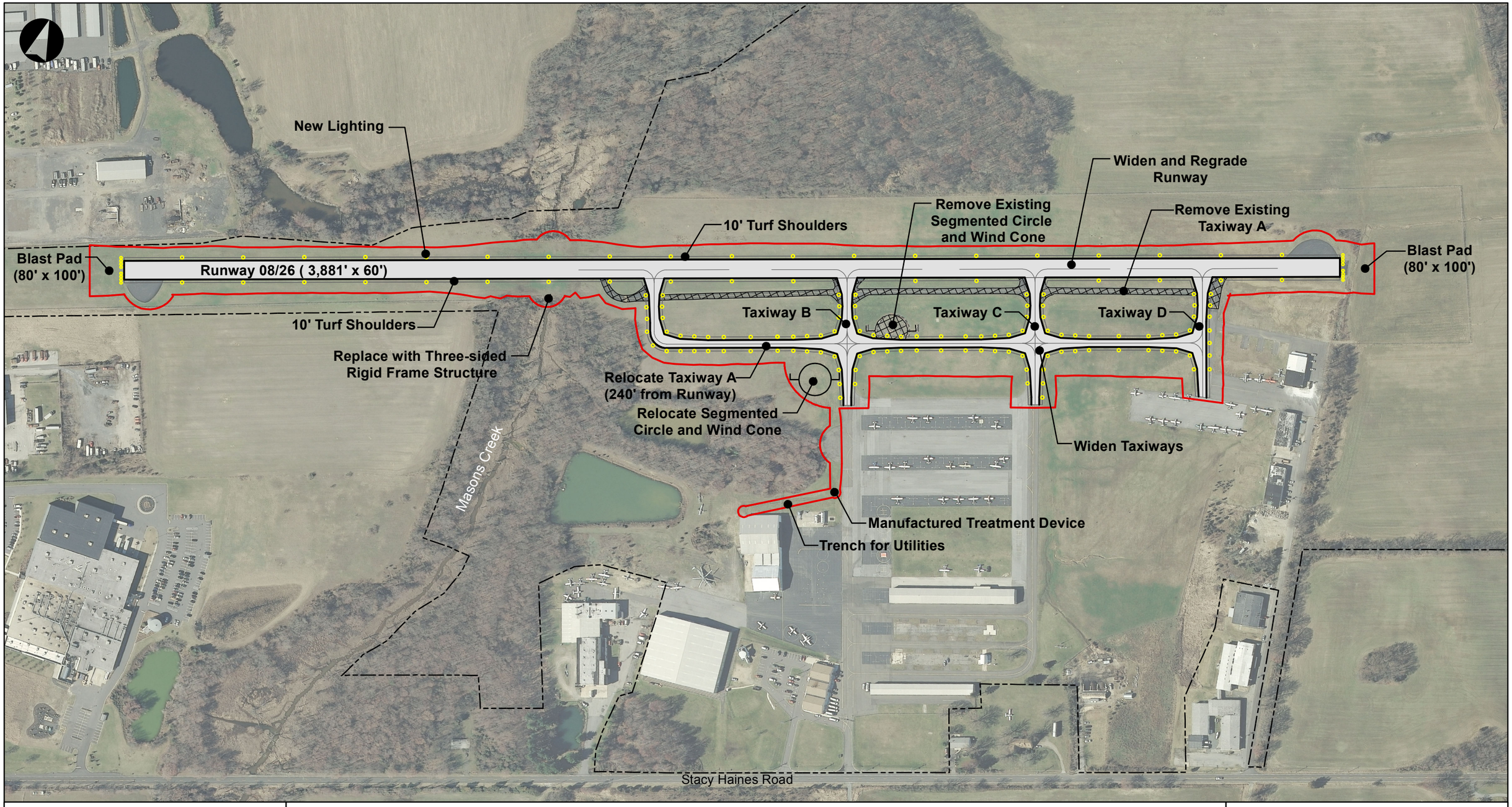


Project Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USGS Mount Holly US Topographic 7.5' quadrangle

Figure 1



300 150 0 300
Feet

Legend

- Project Area
- Airport Property

Proposed Improvements

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Figure 2

3.0 Bog Turtle Status and Natural History

The bog turtle was listed as federally-threatened by the USFWS in 1997 pursuant to the Endangered Species Act of 1973 and State-endangered within New Jersey in 1974 pursuant to the New Jersey Endangered and Nongame Species Conservation Act of 1973 (N.J.S.A. 23:2A et seq.). Its listing status is based on significant population declines due to factors including habitat loss, habitat degradation, and illegal collecting. The bog turtle is the smallest native North American freshwater turtle, with average sizes (adult carapace length) ranging from 82-99 millimeters (Carr, 1952). The carapace ranges in color from light brown to black, which sometimes exhibits a "tortoiseshell" pattern, and the hinge-less plastron is brown or black with contrasting light yellow areas. The bog turtle's skin is generally black and may be flecked with red-orange. The most distinguishing characteristic is the large orange patch on both sides of the head and neck (Behler, 1989; Ernst et al., 1994).

The bog turtle is an omnivore, consuming a variety of food sources including insects, berries, seeds, insect larvae, snails, frogs, slugs, salamanders, earthworms, and small mammals (Ernst et al., 1994). Bog turtles inhabit open, generally spring-fed wet meadows and sphagnum bogs with standing or slow-moving shallow water over a mucky substrate (Bourg, 1992). Bog turtles prefer areas with good sunlight, high evaporation rates, high humidity in the near-ground microclimate, and perennial saturation of portions of the ground.

Bog turtles emerge from hibernation as early as March and are most active in the spring (Ernst, 1977; Ernst et al., 1994). Bog turtles mate in the spring (May to June), and lay a single clutch of three to four eggs. The nesting season lasts from June to July, approximately 21-31 days after copulation (Ernst et al., 1994). Nests are placed in the top of hummocks of sedge or on top of sphagnum in open, sunny areas. After an incubation period of 42 to 56 days, hatchlings emerge in August or September, or may overwinter in nests in northern localities and emerge in April or May. As temperatures increase in the summer months, bog turtles may aestivate for a short period of time or become subterranean, congregating in wetter areas and inhabiting tunnels and burrows. Bog turtles return to winter hibernation sites during the months of October to November (Ernst et al., 1994).

4.0 Survey Methodology and Survey Data

A Phase 1 Bog Turtle Habitat Survey conducted on March 9, 2017 identified two wetlands (Wetland A and Wetland B) that consisted of emergent, scrub-shrub, and forested cover with sufficient mucky soil conditions and spring fed hydrology to warrant characterization as potential bog turtle habitat. Pursuant to the USFWS survey guidelines, the Designated Survey Area (DSA) was identified for each wetland. Overall the combined area of Wetlands A and B totaled approximately 47 acres. The combined DSA within the Phase 1 bog turtle study area was determined to be approximately 3.03 acres. Approximately 1.23 acres of DSA was identified in Wetland A within the Phase 1 bog turtle study area, and approximately 1.8 acres of DSA was identified in Wetland B within the Phase 1 bog turtle study area.

Phase 2 survey methodology followed the USFWS Guidelines for Bog Turtle Surveys (revised April 2006), which were modified from those found in the final Bog Turtle Northern Population Recovery Plan (May 2001). The proposed Phase 2 survey area and acreages of DSA were memorialized in a Phase 2 Survey Plan, which was approved by the USFWS (Appendix B). All field activities were covered under a Scientific Collector's Permit, a copy of which has been included in Appendix C.

The Phase 2 bog turtle surveys for Wetlands A and B were conducted and overseen by Bridger Thompson of AECOM. Mr. Thompson is a USFWS Recognized Qualified Bog Turtle Surveyor who is also recognized in New Jersey by the New Jersey Department of Environmental Protection (NJDEP). Mr. Thompson was assisted by Nathan Jones, Stephanie Williams, David Brightbill, Anthony Velazquez, Kelly McCurry, and Max Ojserkis of AECOM.

Survey techniques included searching visually for exposed individuals and probing/searching by hand, or with sticks, in mud, tunnels, subterranean rivulets, springs, under vegetation, in pockets of standing water, and other microhabitats likely to support bog turtles. Other herpetofauna observed were also documented.

The surveys followed the recommended four to six person-hours of survey per acre of DSA, per visit in order to ensure sufficient effort to locate bog turtles. Four surveys were conducted in each DSA between April 26th and June 8th, 2018. Surveys were separated by at least six days in April and three days in May. Surveys were not conducted when the air and water temperatures were below 55˚ Fahrenheit. Data on weather, dates, times and personnel for each survey conducted are presented in Table 1 below.

Table 1: Phase 2 Bog Turtle Survey Results

Wetland name	Survey Date	Time (in-out)	Search-Effort (hours)	Number of Surveyors	DSA size (in acres)	Total Hours of Search-Effort (per acre)	Weather (start and stop) (cloud-cover estimate)	No. of Bog Turtles Found	Other species observed, Comments
Wetland A (DSA-1)	4/26/18	1305 1445	1.75	4	1.23	5.69	In: 61˚F, 0% cloud cover Out: 66˚F, 0% cloud cover	0	Green Frog (5)
	5/24/18	0930 1100	1.5	4	1.23	4.87	In: 71˚F, 0%cloud cover Out: 76˚F, 0% cloud cover	0	Green Frog (3) Pickerel Frog (2)
	5/29/18	0910 1025	1.25	4	1.23	4.06	In: 63˚F, 0% cloud cover Out: 70˚F, 0% cloud cover	0	Box Turtle (1) Green Frog (5)
	6/08/18	0820 1000	1.66	3	1.23	4.04	In: 68˚F, 0% cloud cover Out: 72˚F, 0% cloud cover	0	N. Water Snake (1) Green Frog (3)
Wetland B (DSA-2)	4/26/18	1130 1245	1.25	4	0.63	7.9	In: 60˚F, 0% cloud cover Out: 61˚F, 0% cloud cover	0	Snapping Turtle (1) Green Frog (10) E. Mud Turtle (2) E. Garter (1)
	5/03/18	1015 1130	1.25	3	0.63	5.95	In: 70˚F, 0% cloud cover Out: 85˚F, 0% cloud cover	0	Painted Turtle (2) E. Mud Turtle (1) Green Frog (10+) N. Water Snake (1)
	5/24/18	0820 0920	1.0	4	0.63	6.35	In: 68˚F, 0% cloud cover Out: 71˚F, 0% cloud cover	0	Green Frog (3) E. Garter (1) Pickerel Frog (2)
	5/29/18	0820 0900	0.66	4	0.63	4.19	In: 66˚F, 90% cloud cover Out: 68˚F, 90% cloud cover	0	Snapping Turtle (1) Green Frog (3)

Table 1 con't

Wetland name	Survey Date	Time (in-out)	Search-Effort (hours)	Number of Surveyors	DSA size (in acres)	Total Hours of Search-Effort (per acre)	Weather (start and stop) (cloud-cover estimate)	No. of Bog Turtles Found	Other species observed, Comments
Wetland B (DSA-3)	4/26/18	1500 1620	1.33	4	1.17	4.54	In: 66˚F, 0% cloud cover Out: 67˚F, 0% cloud cover	0	Green Frog (5) Snapping Turtle (1) E. Mud Turtle (2)
	5/03/18	1140 1340	2.0	3	1.17	5.13	In: 65˚F, 0% cloud cover Out: 72˚F, 0% cloud cover	0	Green Frog (10+) Snapping Turtle (2)
	5/24/18	1100 1230	1.5	4	1.17	5.13	In: 76˚F, 0% cloud cover Out: 78˚F, 0% cloud cover	0	Brown Snake (1) Green Frog (10+) Pickerel Frog (3)
	5/29/18	1025 1145	1.33	4	1.17	4.54	In: 72˚F, 90% cloud cover Out: 80˚F, 90% cloud cover	0	Green Frog (2)

5.0 Survey Area Description

Photographs of the survey areas have been included in Appendix D. Wetland habitats associated with Masons Creek include predominantly emergent and forested types with small scrub-shrub communities located on wetland fringes. The wetlands contained seasonally high groundwater and perennial spring seeps with mucky substrate conditions observed with depths up to 20 inches. Vegetative structure identified in the wetlands include various sedges (Carex spp.), Japanese stiltgrass (Microstegium vimineum), rice cutgrass (Leersia oryzoides), skunk cabbage (Symplocarpus foetidus), jewelweed (Impatiens capensis), reed canary grass (Phalaris arundinacea), sensitive fern (Onoclea sensibilis), cinnamon fern (Osmunda cinnamomea), common reed (Phragmites australis), silky dogwood (Cornus amomum), red maple (Acer rubrum), and smooth alder (Alnus serrulata).

Wetland Area A

Wetland Area A is located north of and adjacent to the existing airport runway. Wetland Area A is confined to the well-defined floodplain of an unnamed tributary to Masons Creek and contains five types of palustrine wetlands including Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Emergent (PEM), Palustrine open water (POW), and Palustrine farmed (Pf) according to the US Fish and Wildlife Service's wetland classification system (Cowardin et al., 1979). The majority of the area is composed of PEM wetlands dominated by Phragmites with small areas of PSS and PFO cover oriented along the fringes of the wetland and POW wetland cover located upstream and outside the study limits. Small areas of Pf wetlands are located in the maintained lawn area associated with the runway infield.

Wetland Area A comprises approximately 27 acres; however, the wetland extends beyond the project area. Dominant vegetation in the DSA includes Japanese stiltgrass, reed canary grass, common reed, cattail (Typha sp.), tussock sedge (Carex stricta), jewelweed, cinnamon fern, and skunk cabbage. Table 3 below contains a complete list of plant species observed during the survey. Hydrology in the wetland is supported by perennial spring seeps and seasonal high groundwater associated with Masons Creek, its unnamed tributary to the west, and associated floodplains. Wetland A also contains potential vernal habitat and multiple man-made ponds associated with its tributary to the west. The DSA of Wetland Area A is shown in Figure 3 and comprises approximately 1.23 acres in the central area of Wetland A.

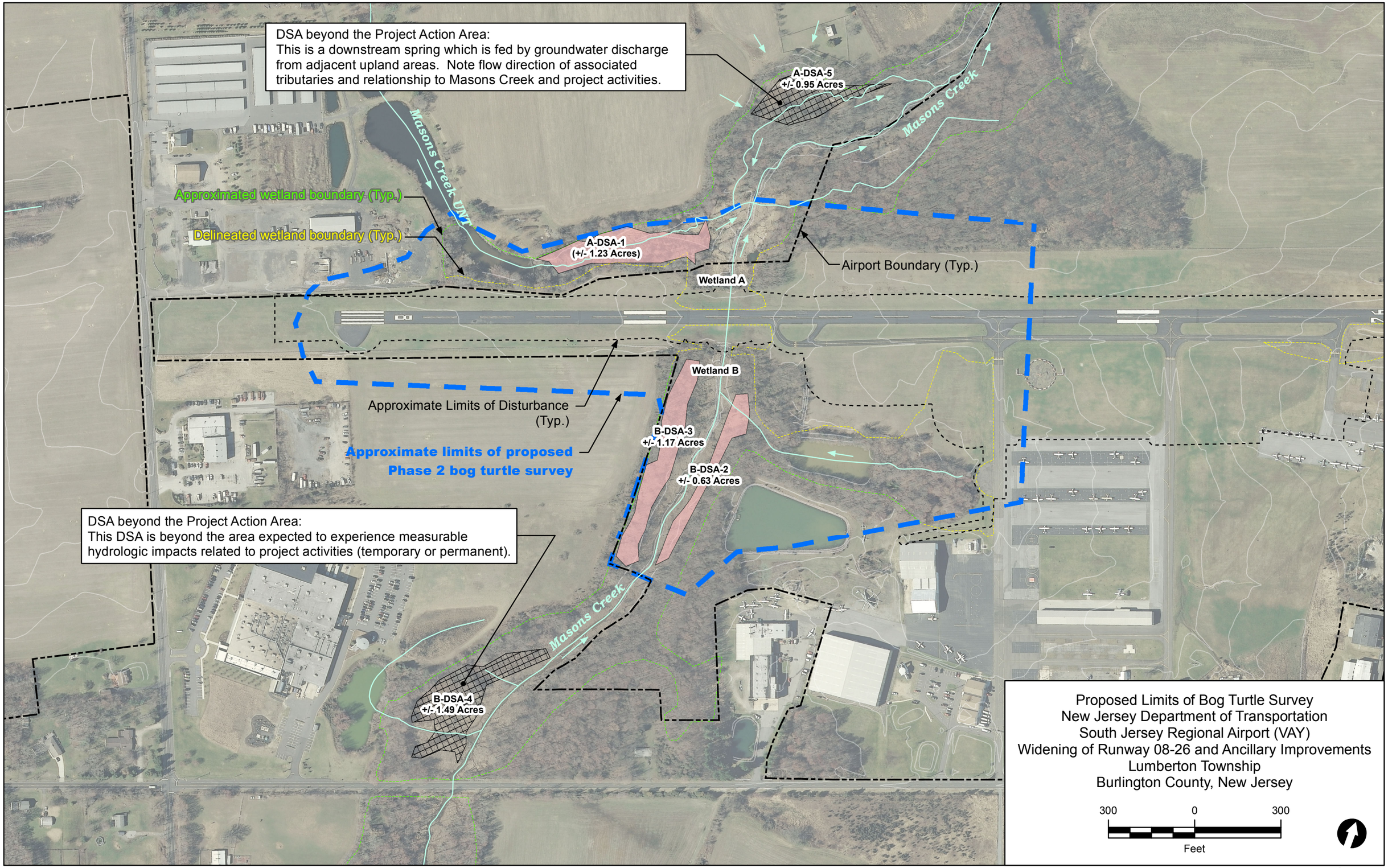

DSA beyond the Project Action Area:
This is a downstream spring which is fed by groundwater discharge from adjacent upland areas. Note flow direction of associated tributaries and relationship to Masons Creek and project activities.
A-DSA-5
+/- 0.95 Acres
Masons Creek
Masons Creek UNT
Approximated wetland boundary (Typ.)
Delineated wetland boundary (Typ.)
A-DSA-1
(+/- 1.23 Acres)
Wetland A
Airport Boundary (Typ.)
Wetland B
Approximate Limits of Disturbance
(Typ.)
Approximate limits of proposed
Phase 2 bog turtle survey
B-DSA-3
+/- 1.17 Acres
B-DSA-2
+/- 0.63 Acres
DSA beyond the Project Action Area:
This DSA is beyond the area expected to experience measurable hydrologic impacts related to project activities (temporary or permanent).
Masons Creek
B-DSA-4
+/- 1.49 Acres
Proposed Limits of Bog Turtle Survey
New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 08-26 and Ancillary Improvements
Lumberton Township
Burlington County, New Jersey
300
0
300
Feet

Figure 3

Table 2: Complete List of Plant Species Observed in Survey Wetland A DSA 1

Scientific Name	Common Name
Acer rubrum	red maple
Arisaema triphyllum	jack-in-the-pulpit
Betula populifolia	gray birch
Carex lurida	lurid sedge
Carex sp.	unidentified sedge
Carex stricta	tussock sedge
Carex vulpinoidea	fox sedge
Carpinus caroliniana	American hornbeam
Cornus amomum	silky dogwood
Dichanthelium clandestinum	deer tongue
Fraxinus pennsylvanica	green ash
Impatiens capensis	jewelweed
Juncus effusus	soft rush
Lindera benzoin	spicebush
Microstegium vimineum	Japanese stiltgrass
Nyssa sylvatica	blackgum
Onoclea sensibilis	sensitive fern
Osmunda cinnamomea	cinnamon fern
Parthenocissus quinquefolia	Virginia creeper
Phalaris arundinacea	reed canary grass
Phragmites australis	common reed
Pilea plumia	clearweed
Polygonum pensylvanicum	Pennsylvania smartweed
Polygonum perfoliatum	mile-a-minute weed
Salix nigra	black willow
Sambucus nigra	elderberry
Shoenoplectus tabernaemontani	softstem bulrush
Smilax rotundifolia	roundleaf greenbrier
Symplocarpus foetidus	skunk cabbage
Toxicodendron radicans	poison ivy
Toxicodendron vernix	poison sumac
Typha angustifolia	narrowleaf cattail
Vaccinium corymbosum	highbush blueberry
Viburnum dentatum	southern arrowwood
Vitis labrusca	fox grape
Woodwardia areolata	netted chain fern

Wetland Area B

Wetland Area B is located south of and perpendicular to the existing airport runway. The wetland is located along the floodplain of Masons Creek and tributaries that originate south of Masons Creek. Portions of Wetland B are located within the maintained infield area adjacent to Taxiway B. Wetland Area B contains five palustrine wetland types including PFO, PSS, PEM, POW, and Pf.

Wetland Area B comprises approximately 20 acres; however, the wetland extends beyond the project area. For the purpose of this survey, Wetland Area B was divided into two survey areas; DSA 2 located along the eastern bank of Masons Creek and DSA 3 located along the western bank. Dominant vegetation in the survey areas include smooth alder, red maple, American hornbeam (Carpinus caroliniana), fox sedge (Carex vulpinoidea), jewelweed, skunk cabbage, Japanese stilt grass, and common reed. Tables 4 and 5 below contain a complete list of plant species observed during the surveys. Wetland hydrology is supported by perennial groundwater seeps and a seasonal high groundwater table associated with Masons Creek and its floodplain. Additional hydrology is associated with beaver activity in the area and the wetland's location on the upstream side of a culvert that conveys Masons Creek under the adjacent runway which results in occasional flooding. The two DSAs of Wetland Area B are shown in Figure 3, with DSA 2 and 3 comprising 0.63 and 1.17 acres, respectively.

Table 3: Complete List of Plant Species Observed in Survey Wetland B DSA 2

Scientific Name	Common Name
Acer rubrum	red maple
Alnus serrulata	smooth alder
Asclepias incarnata	swamp milkweed
Carex lurida	lurid sedge
Carex sp.	unidentified sedge
Carex stricta	tussock sedge
Carex vulpinoidea	fox sedge
Carpinus caroliniana	American hornbeam
Cornus amomum	silky dogwood
Eleocharis obtusa	blunt spikerush
Fraxinus pennsylvanica	green ash
Impatiens capensis	jewelweed
Lindera benzoin	spicebush
Microstegium vimineum	Japanese stiltgrass
Onoclea sensibilis	sensitive fern
Osmunda cinnamomea	cinnamon fern
Parthenocissus quinquefolia	Virginia creeper
Peltandra virginica	arrow arum
Phalaris arundinacea	reed canary grass
Polygonum perfoliatum	arrowleaf tearthumb
Rubus allegheniensis	Allegheny blackberry
Symplocarpus foetidus	skunk cabbage
Toxicodendron radicans	poison ivy
Ulmus americana	American elm
Vaccinium corymbosum	highbush blueberry
Viburnum dentatum	southern arrowwood
Vitis labrusca	fox grape

Table 4: Complete List of Plant Species Observed in Survey Wetland B DSA 3

Scientific Name	Common Name
Acer rubrum	red maple
Alnus serrulata	smooth alder
Arisaema triphyllum	jack-in-the-pulpit
Carex lurida	lurid sedge
Carex sp.	unidentified sedge
Carex stricta	tussock sedge
Carex vulpinoidea	fox sedge
Carpinus caroliniana	American hornbeam
Eleocharis obtusa	blunt spikerush
Impatiens capensis	jewelweed
Juncus effusus	soft rush
Leersia oryzoides	rice cut grass
Lindera benzoin	spicebush
Microstegium vimineum	Japanese stiltgrass
Nyssa sylvatica	blackgum
Parthenocissus quinquefolia	Virginia creeper
Peltandra virginica	arrow arum
Phalaris arundinacea	reed canary grass
Phytolacca americana	pokeweed
Polygonum perfoliatum	arrowleaf tearthumb
Salix nigra	black willow
Symplocarpus foetidus	skunk cabbage
Toxicodendron radicans	poison ivy
Typha angustifolia	narrowleaf cattail
Viburnum dentatum	southern arrowwood
Vitis labrusca	fox grape

6.0 Survey Results and Conclusions

In accordance with the USFWS guidelines, AECOM performed a Phase 2 Bog Turtle Survey for Wetland A DSA-1 and Wetland B DSA-2 and DSA-3 for the South Jersey Regional Airport (VAY) Widening of Runway 08-26 and Ancillary Improvements Project. Survey visits were performed on April 26th, May 03, May 24th, May 29th, and June 8th, 2018. Four Phase 2 survey visits were conducted in each DSA with a total of 62.39 survey hours for the 3.03 acres of DSA in the project area. Phase 2 survey visits were conducted during suitable survey conditions and standardized methods were used in accordance with USFWS guidelines. Habitat conditions at the site are suitable to be considered potential bog turtle habitat; however, no bog turtles, nor signs of bog turtle activity (tracks, shells, or nests), were observed within the identified DSAs during the 2018 survey efforts. Table 1 summarizes the dates of surveys, number of surveyors, survey effort, weather conditions, and species observed. Due to the results of this survey, it is reasonable to assume the probable absence of bog turtles in Wetland A DSA-1 and Wetland B DSA-2 and DSA-3. Multiple other herpetofauna were observed and

recorded during Phase 2 survey efforts. Table 5 presents a list of other herpetofauna observed during the surveys. Photographic documentation of the survey is included in Appendix B.

Table 5: Summary of Other Herpetofauna Observed during Phase 2 Surveys

Scientific Name	Common Name
Lithobates cliamitans	green frog
Terrapene carolina carolina	eastern box turtle
Chelydra serpentine	common snapping turtle
Storeria dekayi	northern brown snake
Thamnophis sirtalis	eastern garter snake
Lithobates palustris	pickerel frog
Nerodia sipedon sipedon	northern water snake

7.0 References

Behler, John L. 1989. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, New York.

Bourg, N.A. 1992. Status of the Bog Turtle (Clemmys muhlenbergii) in North America. Eastern Heritage Task Force of the Nature Conservancy, Middletown, Pennsylvania. Report to the U.S. Fish and Wildlife Service. 33 pp.

Carr, Archie. 1952. Handbook of Turtles: The Turtles of the United States, Canada, and Baja California. Cornell University Press, New York. 542 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States, performed for the U.S. Fish and Wildlife Service. FWS/OBS-79/31.

Ernst, Carl H. 1977. Biological notes on the bog turtle, Clemmys muhlenbergii. Herpetologica 33:241-246.

Ernst, Carl H., Roger W. Barbour, and Jeffrey E. Lovich. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington.

United States Code (87 Stat. 884 as amended; 16 U.S.C. 1531 et seq.). The Endangered Species Act of 1973.

USFWS. 2001. Bog Turtle (Clemmys muhlenbergii), Northern Population Recovery Plan. USFWS Region 5, Hadley, Massachusetts, 83 pp. + appendices.

APPENDIX A

USFWS CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
Tel: 609/646 9310
www.fws.gov/northeast/njfieldoffice/

IN REPLY REFER TO:
2017-I-1117

FEB 27 2018

Paula Scelsi
New Jersey Department of Transportation
1035 Parkway Avenue
Trenton, New Jersey 08625-0600
Email: paula.scelsi@dot.nj.gov

Reference: South Jersey Regional Airport Airfield Improvements, Lumberton Township, Burlington County, New Jersey

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced proposed project pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. The following comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comment by the Service as afforded by other applicable environmental legislation.

A known occurrence or potential habitat for the following federally listed or candidate species is located on or near the project's impact area. However, the Service concurs that the proposed project is not likely to adversely affect federally listed or candidate species for the reasons listed below.

Species	Basis for Determination
Northern long-eared bat (*Myotis septentrionalis*), threatened	No documented roosts or hibernacula occur <0.25 miles of project site. A Northern Long-eared Bat 4(d) Rule Streamlined Consultation Form was received for this project.
Bog turtle (*Clemmys* [*Glyptemys*] *muhlenbergii*), threatened	The potential impact of the proposed project on the hydrology of the suitable bog turtle habitat north and south of the airport runway is not known at this time. As per the February 23 email with Edward Gabsewics, the phase 2 survey for bog turtles will be conducted to determine presence/ likely absence of bog turtle prior to final design of the project and the action agency shall re-initiate consultation with the Service if survey results are inconclusive or indicate presence of bog turtles. The Service concurs that the project is not likely to adversely affect the bog turtle in the event surveys indicate likely absence of the species.
Swamp pink (*Helonias bullata*), threatened	Suitable habitat for the species is present in wetlands both upstream and downstream of the project however; species surveys conducted by Anthony Velazquez indicate that swamp pink is not present in the project action area.

Except for the above-mentioned species, no other federally listed or proposed threatened or endangered flora or fauna under Service jurisdiction are known to occur within the proposed project's impact area. Therefore, no further consultation pursuant to the ESA is required. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

Please refer to this office's web site at http://www.fws.gov/northeast/njfieldoffice/Endangered/ for further information including federally listed and candidate species lists, procedures for requesting ESA review, the National Bald Eagle Management Guidelines, and contacts for obtaining information from the New Jersey Natural Heritage and Endangered and Nongame Species Programs regarding State-listed and other species of concern.

Reviewing Biologist: Alicia Protus
Alicia Protus

Authorizing Supervisor:
Ron Popowski

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
Tel: 609/646-9310
http://www.fws.gov/northeast/njfieldoffice/

IN REPLY REFER TO:
2017-I-1117a

Paula Scelsi
New Jersey Department of Transportation
1035 Parkway Avenue, P.O. Box 600
Trenton, NJ 08625-0600
Email: paula.scelsi@dot.nj.gov

MAY 0 9 2018

Reference: Bog Turtle Phase 2 Survey Plan - South Jersey Regional Airport Widening, Lumberton Township, Burlington County, New Jersey

Pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the U.S. Fish and Wildlife Service (Service) has reviewed your proposed bog turtle phase 2 survey plan dated May 4, 2018 for the above-referenced project.

The Service has made the following determination regarding the subject survey work plan:

X The work plan meets any current Service survey guidelines for the subject species, represents an acceptable level of effort, and appropriately targets potentially suitable habitats within the project's impact area.

____ The work plan is inconsistent with current Service survey guidelines or has the following deficiencies:

As a reminder, a valid Scientific Collecting Permit from the New Jersey Department of Environmental Protection (NJDEP) is required to capture wildlife in New Jersey and must be in your possession when in the field. Survey results must be submitted to the Service and to the NJDEP.

Reviewing Biologist: Alicia Protus
Alicia Protus

Authorizing Supervisor:
Ron Popowski

APPENDIX B

APPROVED PHASE 2 SURVEY PLAN

Bog Turtle Survey Plan

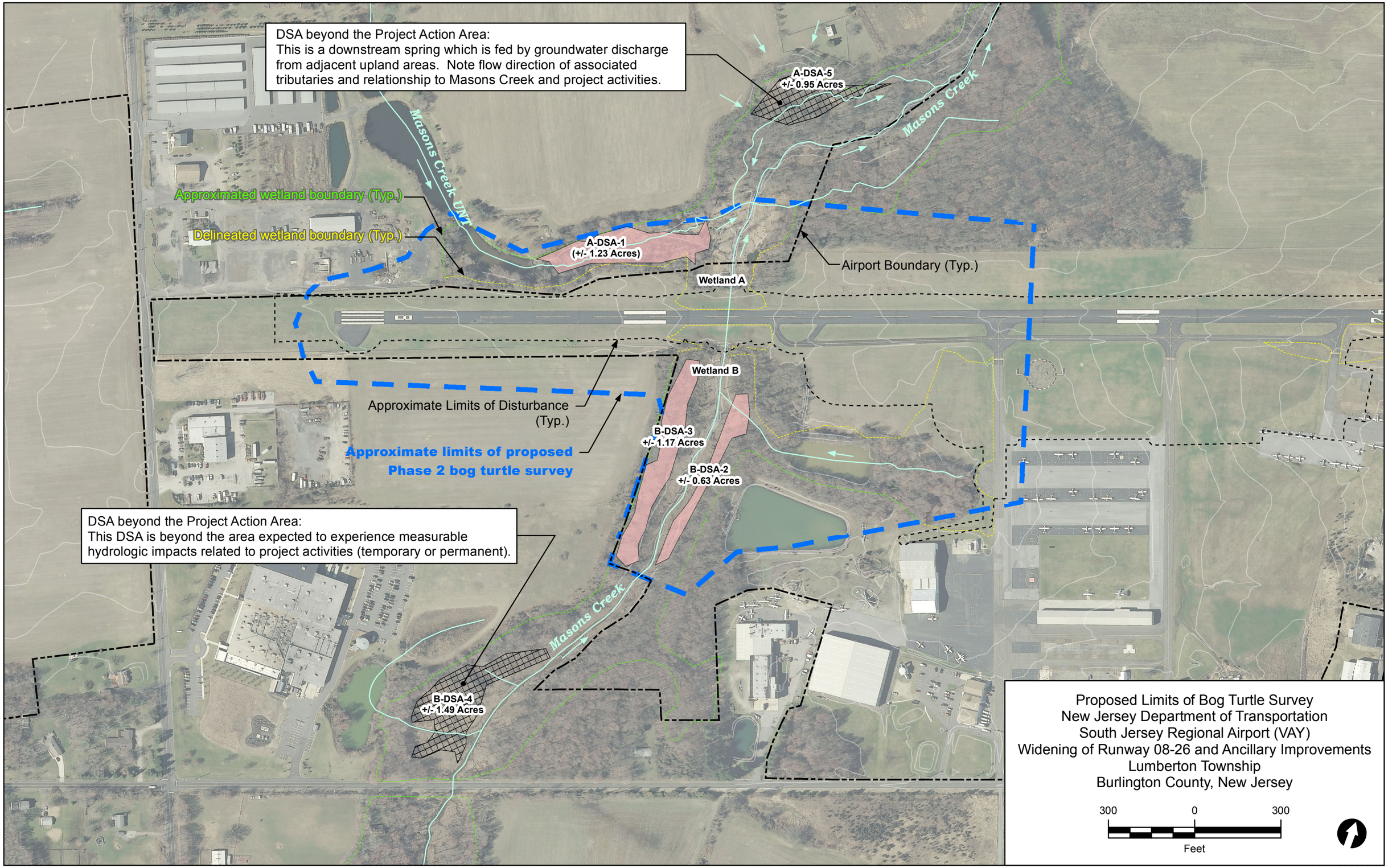
New Jersey Department of Transportation May 4, 2018
South Jersey Regional Airport
Widening of Runway 08 and 26 and Ancillary Improvements
United States Fish and Wildlife Service Project # 2017-I-1117

This survey plan has been prepared by Bridger J. Thompson, a recognized qualified bog turtle (*Glyptemys muhlenbergii*) surveyor in the State of New Jersey. The proposed survey will adhere to the methodologies in the U.S. Fish and Wildlife Services *Guidelines for Bog Turtle Surveys* (revised April 2006), and is intended to determine likely absence of bog turtles for purposes of the above-referenced Project.

On March 9, 2017 AECOM conducted Phase 1 bog turtle habitat investigations to assess wetlands that were identified within the Phase 1 study area. These surveys identified two wetlands (Wetland Area A, and Wetland Area B) that met the criteria to be considered potential bog turtle habitat (PBTH). The USFWS responded to the Phase 1 survey report on February 27, 2018 indicating that if direct or indirect impacts could not be avoided a Phase 2 bog turtle survey would have to be performed to determine presence or likely absence of bog turtles in these wetlands.

AECOM intends to perform the Phase 2 bog turtle surveys for DSA-1, DSA-2 and DSA-3 in wetlands A and B in the 2018 bog turtle survey season. Four surveys will be conducted for each of these DSAs Survey time will be five person-hours per acre of DSA per visit. Surveyors will be on-site for a minimum of one hour regardless of the size of the DSA. The attached map depicts the proposed limits of the Phase 2 Bog Turtle Survey Area, the wetlands that have been identified as PBTH, the estimated wetland extent, and the estimated designated survey area (DSA) for these wetlands. The wetlands (A and B) that were determined to be potential bog turtle habitat during the Phase 1 bog turtle survey extended upstream and downstream beyond the Phase 2 Bog Turtle Survey Area. Investigation from the adjacent roadways and review of aerial imagery indicates that DSA is present within these wetlands outside of the limits of the proposed Phase 2 Bog Turtle Survey Study Area; however, AECOM proposes that these areas are beyond the area expected to experience direct or indirect impacts related to project activities (temporary or permanent). For the purposes of the Phase 2 survey the acreages of B-DSA-2 and B-DSA-3 on the east and west side of Masons Creek in Wetland B will be considered separate, and B-DSA-4 and A-DSA-5 located outside of the property limits will not be investigated. The table below indicates the estimated acreages of DSA within the proposed Phase 2 Bog Turtle Survey Study Area and the proposed Phase 2 survey effort per wetland.

Wetland ID	Wetland type	Approximate Total Wetland Acreage	Estimated DSA	Proposed Person Hours Per Acre	Proposed Person Hours Per Visit	Total Proposed Survey Effort
W-A (DSA-1)	PEM/PSS	27	1.23	5	6.15	24.6 hr
W-B (DSA-2)	PEM/PSS	20	0.63	5	3.15	12.6 hr
W-B (DSA-3)	PEM/PSS	20	1.17	5	5.8	23.40 hr


DSA beyond the Project Action Area:
This is a downstream spring which is fed by groundwater discharge from adjacent upland areas. Note flow direction of associated tributaries and relationship to Masons Creek and project activities.
A-DSA-5
+/- 0.95 Acres
Masons Creek
Masons Creek UNT
Approximated wetland boundary (Typ.)
Delineated wetland boundary (Typ.)
A-DSA-1
(+/- 1.23 Acres)
Wetland A
Airport Boundary (Typ.)
Wetland B
Approximate Limits of Disturbance
(Typ.)
Approximate limits of proposed
Phase 2 bog turtle survey
B-DSA-3
+/- 1.17 Acres
B-DSA-2
+/- 0.63 Acres
DSA beyond the Project Action Area:
This DSA is beyond the area expected to experience measurable hydrologic impacts related to project activities (temporary or permanent).
Masons Creek
B-DSA-4
+/- 1.49 Acres
Proposed Limits of Bog Turtle Survey
New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 08-26 and Ancillary Improvements
Lumberton Township
Burlington County, New Jersey
300
0
300
Feet

April 2018

APPENDIX C

SCIENTIFIC COLLECTORS PERMIT

NEW JERSEY DIVISION OF
Fish and Wildlife

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DIVISION OF FISH & WILDLIFE
WILDLIFE PERMITS UNIT
Exotic & Nongame Wildlife Permits
26 Route 173 West
Hampton NJ 08827

PHONE: (908) 735-5450 - FAX: 908-735-5689
E-mail Address: EXOTICPERMITS@dep.nj.gov

CATHERINE R. MCCABE
Acting Commissioner

SCIENTIFIC COLLECTING PERMIT

This will certify that the NJ Division of Fish and Wildlife has authorized:

AECOM
Bridger Thompson
100 Sterling Parkway, Suite 205
Mechanicsburg PA 17050

to collect/possess/release the following native fauna for scientific study:

PURPOSE OF STUDY: To conduct Phase II bog turtle surveys at the locations listed below.

SPECIES AND NUMBERS: Unlimited numbers of Bog Turtles (*Glyptemys muhlenbergii*) may be collected and released to determine population numbers in the area.

SPECIAL CONDITIONS:

1. Visual survey methods and probing will be utilized to find turtles following Phase II survey guidelines.
2. All turtles may be marked for identification (e.g. shell-notched) and data collected consistent with ENSP and US Fish and Wildlife Service (USFWS) requirements.
3. **NO TURTLE MAY BE REMOVED FROM THE SITE** without prior consent from ENSP.
4. All turtles must be released immediately at capture location after all pertinent information (measurement, sexing, tagging/notching, and photograph) has been recorded.
5. If a bog turtle is found during contract Phase I or Phase II surveys, Brian Zarate, ENSP biologist and Wendy Walsh, USFWS, must be notified immediately. Turtles found during ENSP assigned site surveys do not need to be reported immediately.
6. All boots, probing sticks, and related gear must be thoroughly cleaned and sanitized between visits to different wetlands to risk the spread of harmful pathogens between populations. Protocols found here: http://www.northeastparc.org/products/pdfs/NEPARC_Pub_2014-02_Disinfection_Protocol.pdf
7. A report must be submitted to Brian Zarate, NJ Div. of Fish & Wildlife, Endangered and Nongame Species Biologist, 1 Van Syckels Rd., Clinton, NJ 08809, (908) 638-6482, at the end of this study as well as to the Wildlife Permits Unit by January 31 for the preceding calendar year ending December 31.

LOCATIONS: Phase II surveys will be conducted in wetlands identified as potential bog turtle habitat located in Block 36, Lot 14 in Lumberton Twp., Burlington County. (39.9442244 N, -74.847847 E). The survey area is located in two wetlands that are situated upstream and downstream of South Jersey Regional Airport's 8-26 runway crossing of Mason's Creek.

NEW JERSEY DIVISION OF
Fish and Wildlife

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF FISH & WILDLIFE
WILDLIFE PERMITS UNIT
Exotic & Nongame Wildlife Permits
26 Route 173 West
Hampton NJ 08827

PHONE: (908) 735-5450 - FAX: 908-735-5689
E-mail Address: EXOTICPERMITS@dep.nj.gov

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. MCCABE
Acting Commissioner

SCIENTIFIC COLLECTING PERMIT (continued)

STUDY DATES: April 15, 2018 – June 15, 2018.

SUBPERMITTEES: Nathan Jones, Bill Weihbrecht, Stephanie Williams, David Brightbill, Will Anderson, Andrew Hally, Justin Keil, Anthony Velazquez, Max Ojserkis, Mark Benfer, Deborah Poppel, and Kelly McCurry.

IMPORTANT NOTE: A COPY OF THIS PERMIT AND A COPY OF THE ATTACHED GENERAL CONDITIONS FOR SCIENTIFIC COLLECTING PERMITS MUST BE CARRIED BY ALL PERMITTEES AND SUBPERMITTEES WHILE IN THE FIELD AND SHOWN UPON REQUEST WHILE ENGAGED IN COLLECTION ACTIVITIES. ALL SPECIFIC AND GENERAL CONDITIONS MUST BE STRICTLY ADHERED TO.

Every effort must be made to preserve natural habitats during research and collecting activities.

Any sightings or captures of Endangered and Threatened Wildlife must be reported to the Division of Fish and Wildlife on the enclosed ENDANGERED AND THREATENED WILDLIFE SIGHTING REPORT FORM. The report form must be fully completed and accompanied by a map with the location plotted. The collection of New Jersey State Endangered and Threatened Species is *STRICTLY PROHIBITED* unless otherwise authorized.

Entrance to any land must be with the prior permission of the landowner or managing governmental agencies. **An annual report must be submitted to the New Jersey Division of Fish and Wildlife, Wildlife Permits Unit by January 31 for the preceding calendar year ending December 31**. End of year report should include purpose of study, study design, conservation value of study, methods, data collected and results.

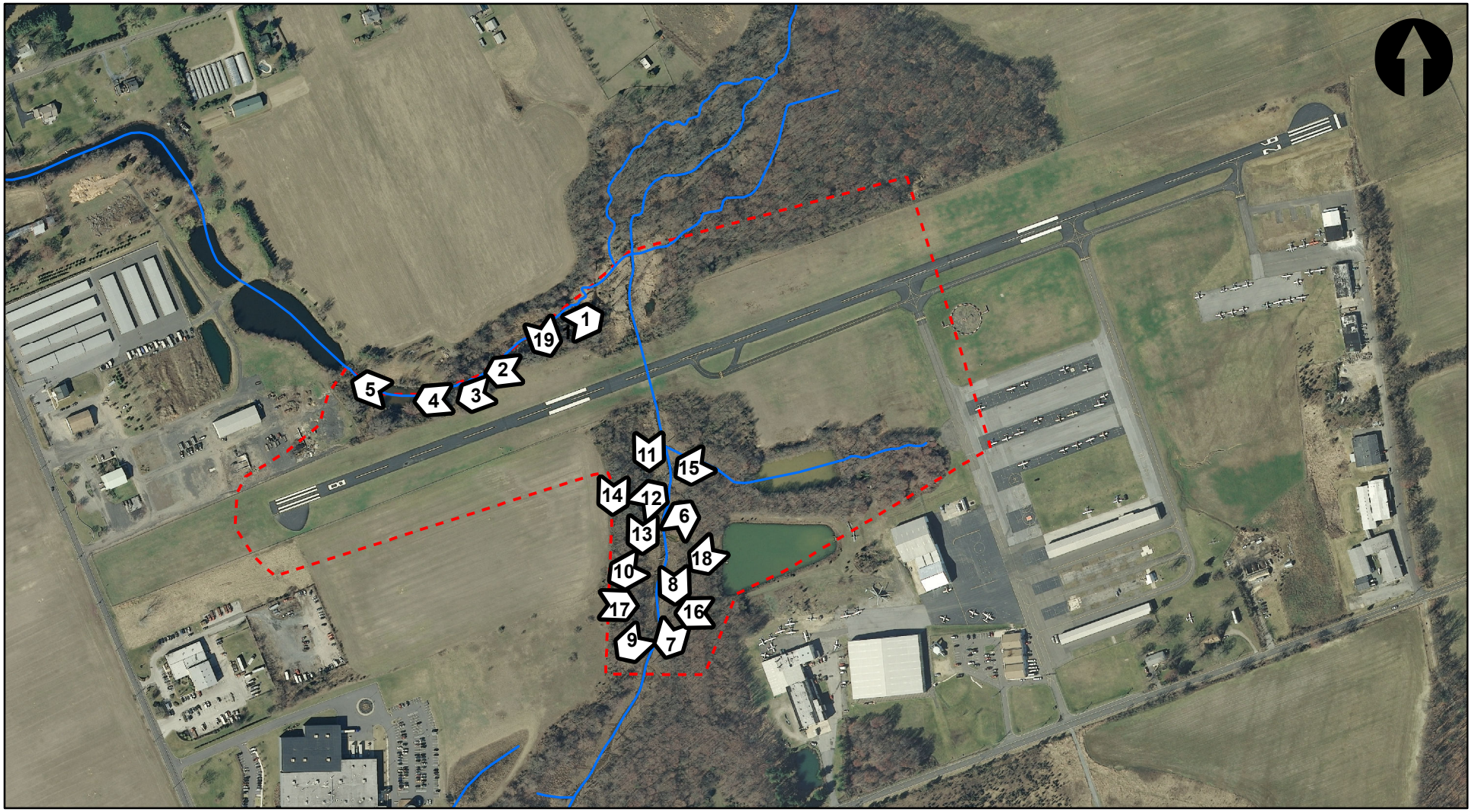
DATE ISSUED: APRIL 9, 2018 – Amended May 8, 2018
THIS PERMIT EXPIRES DECEMBER 31, 2018
FEE PAID: $22.00

Larry Herrighty
DIRECTOR
DIVISION OF FISH & WILDLIFE

c:
-Central Region Law Office
-Brian Zarate, ENSP, Div. of Fish & Wildlife
-file

APPENDIX D

PHOTOGRAPHS



Survey Area

Masons Creek

Photo location and direction

500 250 0 500

Feet

Photolocation Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Photo 1 – View facing northeast of potential bog turtle habitat located within Wetland Area A DSA 1 (dated May 29, 2018).

Photo 2 – View facing west of potential bog turtle habitat located within Wetland Area A DSA 1 (dated May 29, 2018).

Photo 3 – View facing west of potential bog turtle habitat oriented along a tributary to Masons Creek located within Wetland Area A DSA 1 (dated May 29, 2018).

Photo 4 – View facing west of certified bog turtle surveyor Bridger Thompson and field technicians conducting the Phase 2 bog turtle survey in Wetland Area A DSA 1 (dated May 29, 2018).

Photo 5 – View facing northwest of the private pond located along the unnamed tributary to Masons Creek on the western end of Wetland Area A DSA 1 (dated May 29, 2018).

Photo 6 – View facing northeast of potential bog turtle habitat located within the forested area of Wetland Area B DSA 2 (dated May 29, 2018).

Photo 7 – View facing south of potential bog turtle habitat oriented along Masons Creek within Wetland Area B DSA 2 (dated May 24, 2018).

Photo 8 – View facing south of potential bog turtle habitat dominated by Japanese stilt grass located within Wetland Area B DSA 2 (dated May 29, 2018).

Photo 9 – View facing southwest of potential bog turtle habitat located within Wetland Area B DSA 3 (dated May 29, 2018).

Photo 10 – View facing southwest of potential bog turtle habitat within the forested section of Wetland Area B DSA 3 (dated May 29, 2018).

Photo 11 – View facing south of potential bog turtle habitat oriented along the western bank of Masons Creek within Wetland Area B DSA 3 (dated May 29, 2018).

Photo 12 – View facing northeast of Masons Creek taken from within Wetland Area B DSA 3 (dated May 29, 2018).

Photo 13 - View facing south of Masons Creek taken from within Wetland Area B DSA 3 (dated May 29, 2018).

Photo 14 – Photo of brown snake identified in Wetland Area B DSA 3 (dated May 29, 2018).

Photo 15 – Photo of eastern garter snake identified in Wetland Area B DSA 2 (dated April 26, 2018).

Photo 16 – Photo of eastern mud turtle identified in Wetland Area B DSA 2 (dated April 26, 2018).

Photo 17 – Photo of northern green frog identified in Wetland Area B DSA 3 (dated April 26, 2018).

Photo 18 – Photo of snapping turtle identified in Wetland Area B DSA 2 (dated May 29, 2018).

Photo 19 – Photo of eastern box turtle identified in Wetland Area A DSA 1 (dated May 29, 2018).

Appendix C
Form AD-1006

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request	
Name of Project: South Jersey Regional Airport	Federal Agency Involved: FAA	
Proposed Land Use: Aviation Runway and Taxiway	County and State: Burlington County, New Jersey	
PART II *(To be completed by NRCS)*	Date Request Received By NRCS	Person Completing Form:

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐	NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %		Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	27.6			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	11			
2. Perimeter In Non-urban Use	(10)	0			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	5			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	10			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	0			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	26	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	26	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	26	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

Appendix D
Cultural Resources Documentation

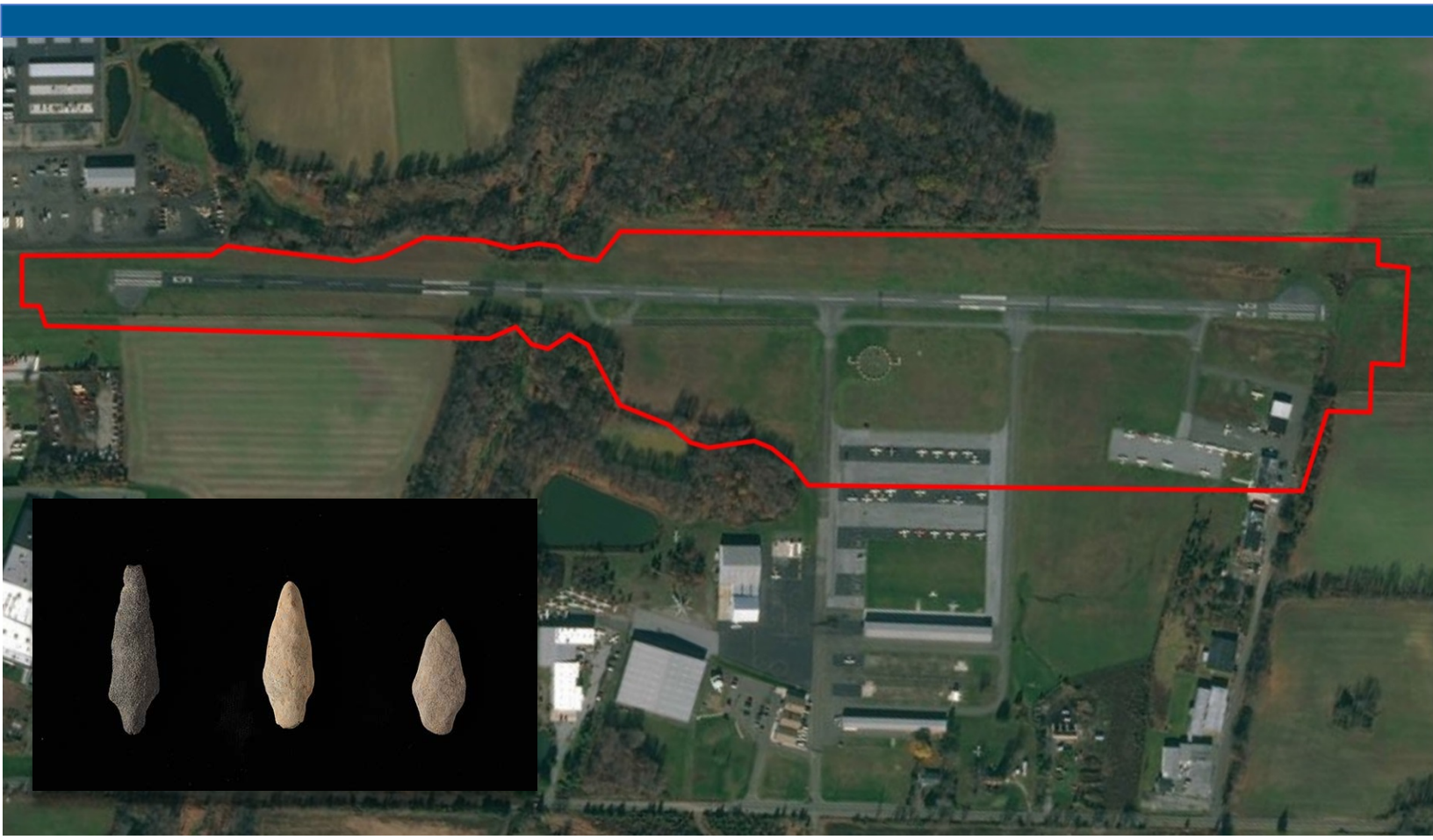
CULTURAL RESOURCE SURVEY

South Jersey Regional Airport Widening of Runway 8-26
And Ancillary Improvements
Township of Lumberton, Burlington County, New Jersey

Prepared For:

New Jersey Department of Transportation

February 2018



Prepared By:

Jean E. Howson and Leonard G. Bianchi
NV5 Cultural Resource Unit

NV5

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CULTURAL RESOURCE SURVEY

South Jersey Regional Airport
Widening of Runway 8-26 and Ancillary Improvements
Township of Lumberton, Burlington County, New Jersey

Prepared for:

New Jersey Department of Transportation

Prepared by:

Jean E. Howson and Leonard G. Bianchi

Cultural Resource Unit

NV5

February 2018

MANAGEMENT SUMMARY

A Cultural Resources Survey was conducted by NV5, Inc. for the New Jersey Department of Transportation (NJDOT) for their proposed South Jersey Regional Airport Widening of Runway 8-26 and Ancillary Improvements Project in Lumberton, Burlington County, New Jersey.

No historic architectural resources requiring survey were identified within the project Area of Potential Effect. A Phase I survey addressed archaeological resources. The western portion of the Area of Potential Effect was determined to have potential for Pre-Contact archaeological resources. Field testing included excavation of a total of 284 shovel tests with the majority placed at 50' intervals along a series of east/west transects. A Pre-Contact archaeological site was identified to the north of the existing runway. Five 3' x 3' test units were excavated within the site area. Pre-Contact artifacts were found in the plow zone and in the subsoil.

The identified site is not considered eligible independently for inclusion in the National Register of Historic Places. However, it apparently represents the southern edge of previously-recorded site 28-Bu-62, and intact archaeological deposits likely extend to the north of the airport fence; it may also be part of previously-recorded site 28-Bu-324. As such the resources identified in the Phase I/II survey may be part of a significant site complex that has not been evaluated as a whole for National Register eligibility. It is necessary to consider the protection of these resources in any future work at the South Jersey Regional Airport.

The following measures have been adopted to avoid impacts to this site: 1) all proposed work, including construction access, staging areas and project construction will be specifically precluded from using any part of the identified site via substantial fencing; 2) project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction; 3) a permanent survey marker will be installed to assist with the accurate relocation of the site in the future.

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1. INTRODUCTION

1.1 Introduction

The following report describes a Cultural Resources Survey conducted by NV5, Inc. for the New Jersey Department of Transportation (NJDOT) for their proposed South Jersey Regional Airport Widening of Runway 8-26 and Ancillary Improvements Project (the Project) in Lumberton, Burlington County, New Jersey (Figures 1.1 and 1.2). The Project involves funding provided by the Federal Aviation Administration (FAA), and anticipated required NJDEP permits include Freshwater Wetlands Individual Permit and Water Quality Certificate; Flood Hazard Area Individual Permit; and Construction Activity Stormwater General Permit. This survey was undertaken to identify historic properties in accordance with New Jersey Freshwater Wetlands Protection Act Rules and pursuant to the instructions and intents set forth by Section 101 (b)(4) of the National Environmental Policy Act of 1969; Section 1(3) and 2(b) of Executive Order 11593; Section 106 of the National Historic Preservation Act; 23 CFR 771, as amended October 30, 1980; the guidelines developed by the Advisory Council on Historic Preservation published November 26, 1980; the amended procedures for the Protection of Historic and Cultural Properties as set forth in 36 CFR § 800 (October 1, 1986); and the amended procedures for the Protection of Historic Properties as set forth in 36 CFR § 800 (May 18, 1999). Section 106 consultation was initiated in October, 2017 and the letter (Rappleye to Marcopul October 27, 2017) is contained in Appendix A of this report.

This study has involved background research, field survey, laboratory processing and analysis, and the preparation of this report. Background research was conducted by Jean Howson and Richard L. Porter. Archaeological fieldwork was conducted under the supervision of Leonard G. Bianchi. NV5's contacts during this study were Lauralee Rappleye of NJDOT and Vincent Maresca of the New Jersey Historic Preservation Office (NJHPO).

One Pre-Contact archaeological site has been identified within the project's Area of Potential Effect (APE). This site is considered to be a part of the previously-recorded site(s) 28-Bu-62/28-Bu-324. A plan to avoid and protect the site was adopted by NJDOT and the project engineer following an end-of-field report on Phase IB testing; subsequently, supplemental testing of the site was conducted in order to better delimit its vertical extent and determine its significance.

This survey concluded that the archaeological resources that lie within the present project area do not independently meet Evaluation Criterion "d" for inclusion in the National Register of Historic Places. Only a very small quantity of diagnostic artifacts was recovered, mainly from the plow zone, and no features were identified. However, it is considered essential to protect these resources because they represent a portion of a larger site or site complex, the integrity of which has not been evaluated through systematic archaeological testing. The nature and density of recorded archaeological resources in the immediate vicinity, including to the south of the project area, point to a highly significant site complex along this portion of Masons Creek.

No further archaeological work is recommended in conjunction with the present project. Engineering controls to protect the identified site (demarcation of the site area on project plans, placement of a permanent survey marker, and on-site fencing to protect the site area) have been agreed upon by NJDOT and NJSHPO.

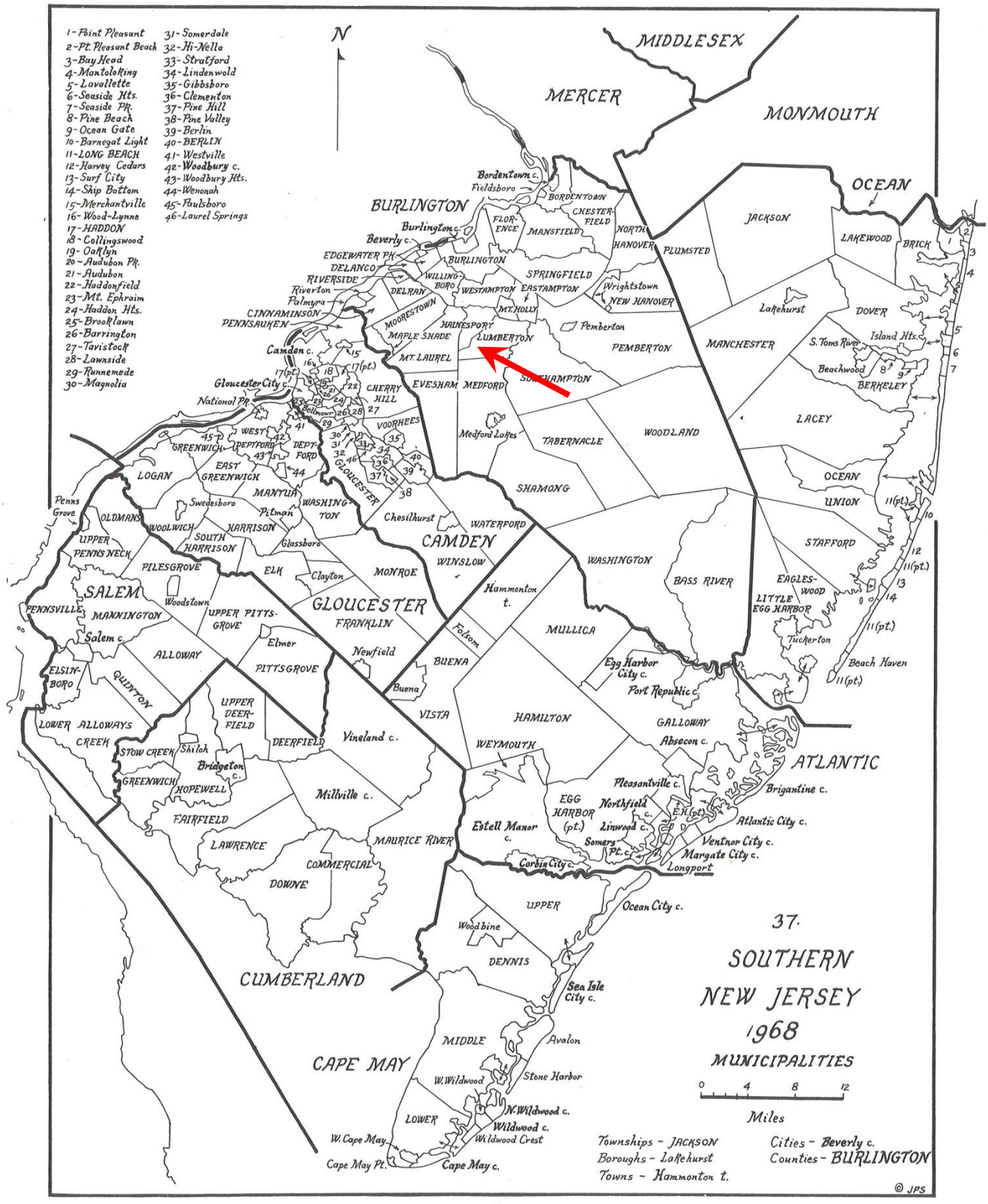


Figure 1.1. General location of the project area shown on Snyder's map of southern New Jersey (Snyder 1969:257).

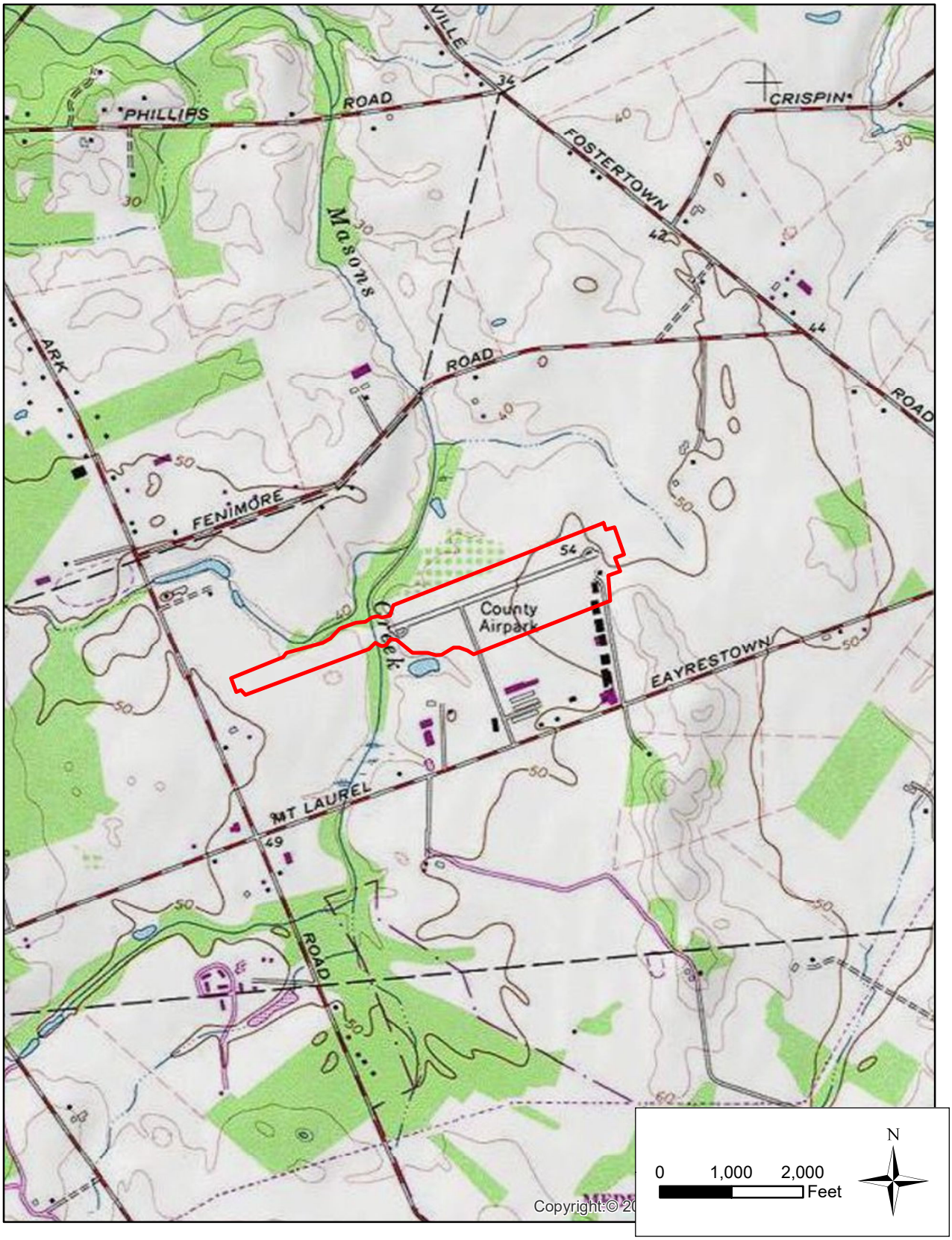


Figure 1.2. Project area shown on USGS Mt. Holly, NJ Quadrangle.

1.2. Project Background

In order to maintain safe and efficient airport operations, the NJDOT proposes to modify Runway 8-26 to meet FAA standards for the current design aircraft (B-I) and to relocate parallel Taxiway A to meet FAA standards for the future design aircraft (B-II). The Proposed Action would not increase the capacity of the airport or change the operational environment of the airport when compared to existing conditions. The proposed improvements are intended to correct non-standard conditions associated with the existing runway and taxiways.

The major elements of the project are:

- Widen Runway 8-26 from 50 feet to 60 feet
- Regrade Runway 8-26 and the surrounding Runway Safety Area (RSA)
- Provide turf shoulders along the runway and turf blast pads at each end
- Clear the surrounding Runway Object Free Area (ROFA) including tree removal to the degree practicable
- Relocate and widen parallel Taxiway "A" from approximately 20 feet to 35 feet, and extend the connecting taxiways
- Relocate the segmented circle and wind cone

Ancillary elements of the project include:

- Site preparation, grading, drainage, and stormwater management facilities
- Replacement of the existing culvert crossing of Masons Creek with a three-sided box culvert, or modification of the existing crossing by adding two additional 48-inch culverts
- Demolition/removal of existing Taxiway "A" pavement
- Runway/taxiway lighting and markings
- Trenching for buried utilities

Project plans are contained in Appendix B of this report. AECOM serves as the engineering consultant for the runway project. Lauralee Rappleye of NJDOT contacted Vincent Maresca of the New Jersey Historic Preservation Office on July 19, 2017 to provide preliminary information compiled by AECOM on the potential for cultural resources within the project area and to confirm the need for and extent of archaeological testing. Copies of this correspondence were reviewed by NV5 in order to develop the scope of work for the present survey.

1.3. Area of Potential Effect and Survey Scope of Work

The Area of Potential Effect (APE) was defined preliminarily in discussions with NJDOT and NJHPO, as noted above, prior to commencing field investigations. It was subsequently formally defined by NJDOT in the Initiation of Consultation for Section 106 (Rappleye to Marcopul dated October 26, 2017; see Appendix A), and is shown on Figure 1.3. The archaeological APE includes all areas within the Limit of Disturbance as shown on project plan sheets 6, 7, and 8 (see Appendix B). In addition, as recommended by AECOM, it includes a variable 50-foot to 150-foot buffer zone within adjacent open, unpaved areas to accommodate disturbances from construction activity.

Consultation between Lauralee Rappleye of NJDOT and Vincent Maresca of the New Jersey Historic Preservation Office (NJHPO), in correspondence dated July 19 and July 24, 2017, resulted in a determination that the portion of this APE located east of Station 124+75 has little potential for

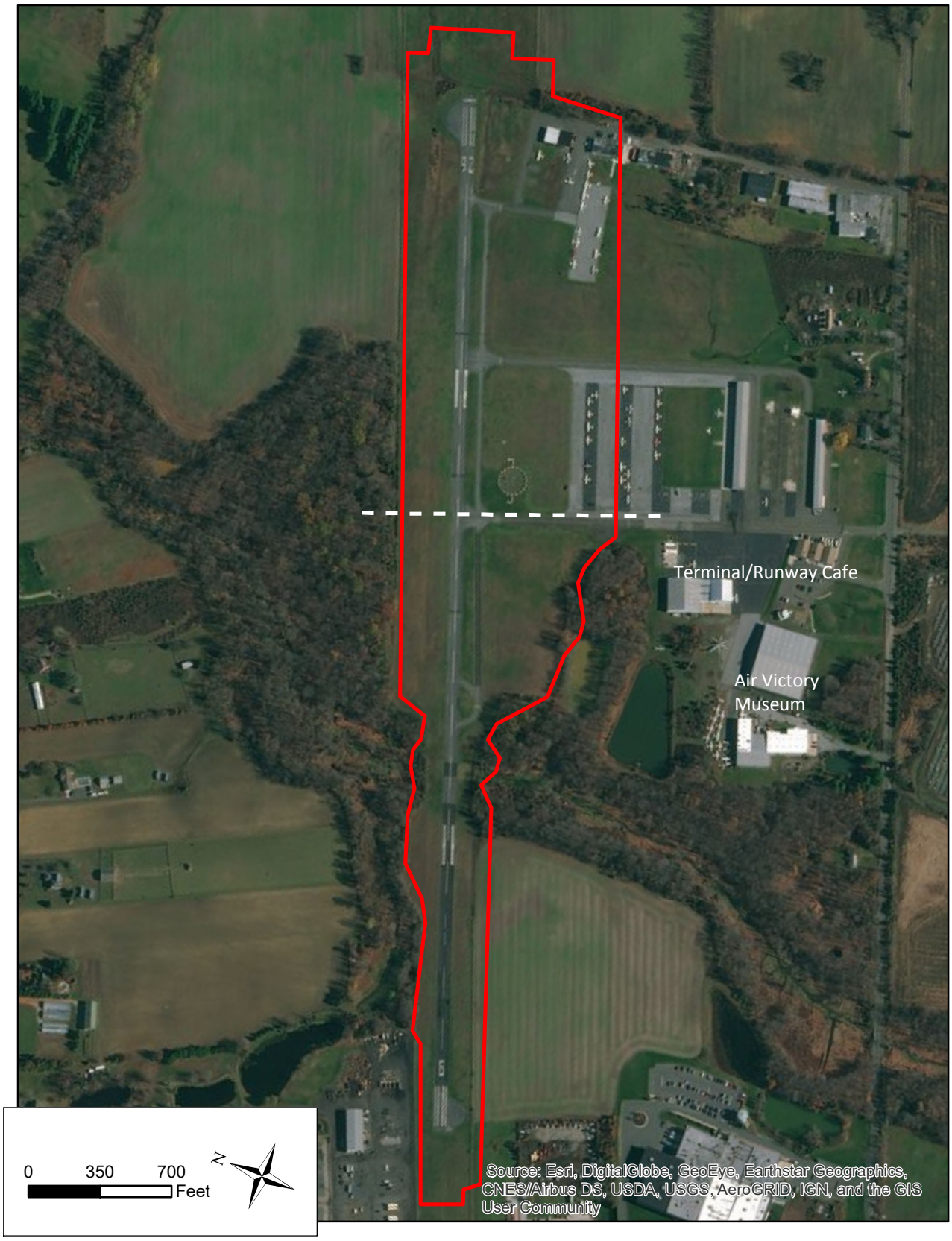


Figure 1.3. Area of Potential Effect for both above-ground and archaeological resources for the runway expansion project (red outline). The area within the APE lying east of the dashed white line was determined during SHPO consultation to have insufficient potential to warrant Phase IB archaeological testing.

archaeological resources and therefore did not require testing (Appendix A). Based on the density of known pre-Contact sites in the vicinity and the proximity to Masons Creek, the remainder of the APE was considered to have high potential for Pre-Contact Period resources and required archaeological testing in a Phase IB survey.

The APE for historic architecture is limited because the majority of the proposed work is extremely low in profile and no buildings will be removed. It includes two buildings at the South Jersey Regional Airport that are located immediately adjacent to the proposed runway expansion. The first of these, currently designated as Building One, is located just to the south of the far eastern end of the runway. It is a single-story concrete block and steel structure with large wooden aircraft doors at the northern and southern ends and a low gable roof. Building One was constructed between 1963 and 1965 and remains in use as a hangar. The second building is sited immediately to the south of Building One and is also a single-story concrete block and steel gable-roofed structure. The large wooden aircraft door at the northern end remains in place, while the door at the southern end has been replaced concrete block infill. This building, which is now utilized as an event space, was constructed between 1965 and 1970. Neither of these two buildings was viewed by NJDOT or NV5 as warranting architectural survey, and the New Jersey Historic Preservation Office concurred with this assessment (see Appendix A).

Upon completion of the Phase IB archaeological survey, which identified one archaeological site, an end-of-field memorandum was prepared and additional consultation was sought with NJHPO. In correspondence dated September 28, 2017 and a conference call that took place on October 3, 2017 between Ms. Rappleye, Mr. Maresca, and NV5 archaeologists, a scope of work for supplemental testing involving hand excavation of 5 3'x3' test units within the site area as delimited by shovel testing, as well as a plan to avoid the identified site were developed. Implementation of engineering controls for avoidance was agreed to by the project engineers, and the supplemental survey plan was approved by SHPO. This allowed Section 106 consultation to be completed as needed for preparation of the Environmental Assessment for the project.

2. ENVIRONMENTAL SETTING

Photographs in Plates 2.1 through 2.4 show the project area at the time of the present archaeological survey – the photo location key for these and subsequent plates is in Figure 2.1. The project area lies on the inner side of the ridge separating New Jersey's Inner and Outer Coastal Plain geomorphic areas. The geographic setting is illustrated in historic context by the late 19th-century USGS map reproduced in Figure 2.2. It spans Mason's Creek, a permanent, north-flowing, many-armed tributary of Rancocas Creek, which in turn flows westward into the Delaware River. Mason's Creek is bordered by wooded wetlands today, and early 20th-century archaeologists working here suggested that, based on the extent of associated swampland, the creek was once a larger watercourse accessible from the Delaware by canoe (Hawkes and Linton 1916:56). The creek is carried beneath the airport runway in 5 culverts.

The property is at an elevation of approximately 50 feet above sea level, and the ground slopes slightly down toward the west. Surficial geology of the bulk of the project area is Upper Stream Terrace Deposits, with Alluvium along the main branch of Masons Creek. The north end of a long, low knoll or cuesta, a northward protrusion of the Hornerstown Formation, lies just to the east of the project area. Its surficial geology is Upland Gravel, Lower Phase. Periglacial features are present in the general vicinity, mainly small oval-shaped basins known as pingoes, which are known loci of Pre-Contact sites in the region. Two of the Pre-Contact archaeological sites located south of the airport were reportedly within 30 and 55 feet of thermokarst basins, and one possible such feature is located just west of the planned runway extension where Pinelands Site #72 (not described), is mapped at this feature. The Paleo-Indian Logan Site in Lumberton is also situated on a large periglacial basin feature (see discussion of previous research in the following section).

Specific project area soils include Holmdel, Kresson and Marlton Series, plus Fluvaquents along the creeks. Mapped soil units shown on Figure 2.3. are as follows:

HodA – Holmdel fine sandy loam, 0-2% slopes, moderately well drained
FmhAt – Fluvaquents, loamy, 0-3% slopes, frequently flooded (along the banks creeks)
KreA – Kresson fine sandy loam, 0-2% slopes, somewhat poorly drained
MapA – Marlton fine sandy loam, 0-2% slopes, well drained
MapB – Marlton fine sandy loam, 2-5% slopes, well drained
URSAAB – Urban land, sandy, 0-8% slopes
URCLAB – Urban land, clayey substratum, 0-8% slopes

On Holmdel, Kresson, and Marlton soils, native vegetation is hardwood forest (oak, hickory, beech, ash, red cedar, yellow poplar, and Virginia pine) and these units are suited for open and woodland wildlife (Markley 1971).

Overall, the project vicinity was an excellent location for prehistoric occupation, based on proximity to Mason's Creek; the inclusion of areas of well-drained soils on relatively level ground; and nearby periglacial features and the neighboring ridge which may have provided additional exploitable natural resources. The presence of numerous known sites in the vicinity bears this out (see the following section).

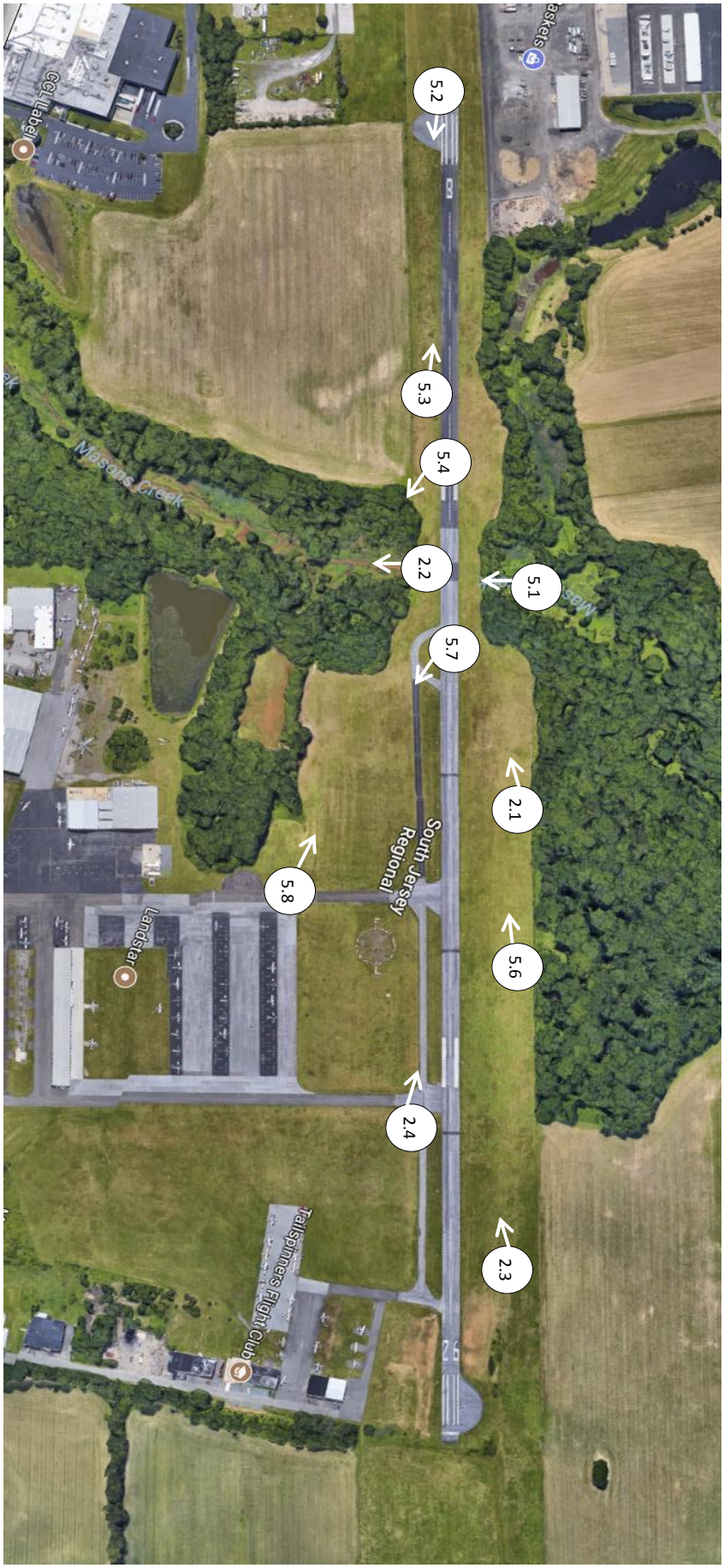


Figure 2.1. Locations of photographs in report Sections 2 and 5.

Plate 2.1. Project area north of the airport runway. Masons Creek is in the background. The creek is carried beneath the runway in culverts. View toward southwest. Photograph: Jason R. Nargiz, September 2017 [NV5-1312.jpg].

Plate 2.2. Mason's Creek south of the airport runway, view to south (upstream). Photograph: Jason R. Nargiz, September 2017 [NV5-1357.jpg].

Plate 2.3. North portion of South Jersey Regional Airport seen from the east. View is to west. Photograph: Jason R. Nargiz, September 2017 [NV5-1329.jpg].

Plate 2.4. Existing runway and taxiways at the South Jersey Regional Airport. View is to west. Photograph: Jason R. Nargiz, September 2017 [NV5-1320.jpg].

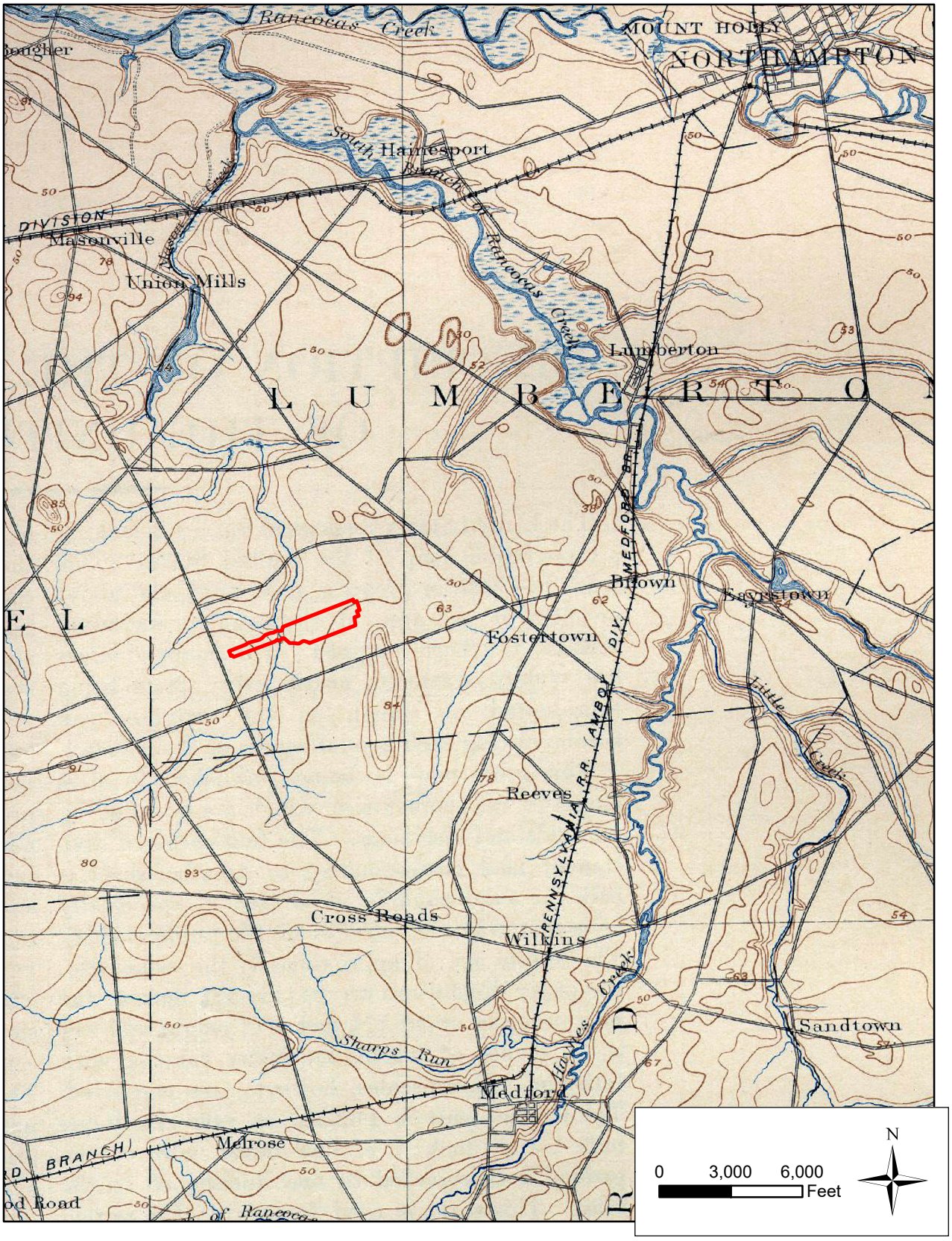


Figure 2.2. 1898 U.S.G.S. Mount Holly, NJ Quadrangle showing the project area in relation to the Rancocas Creek drainage system and the local topography.

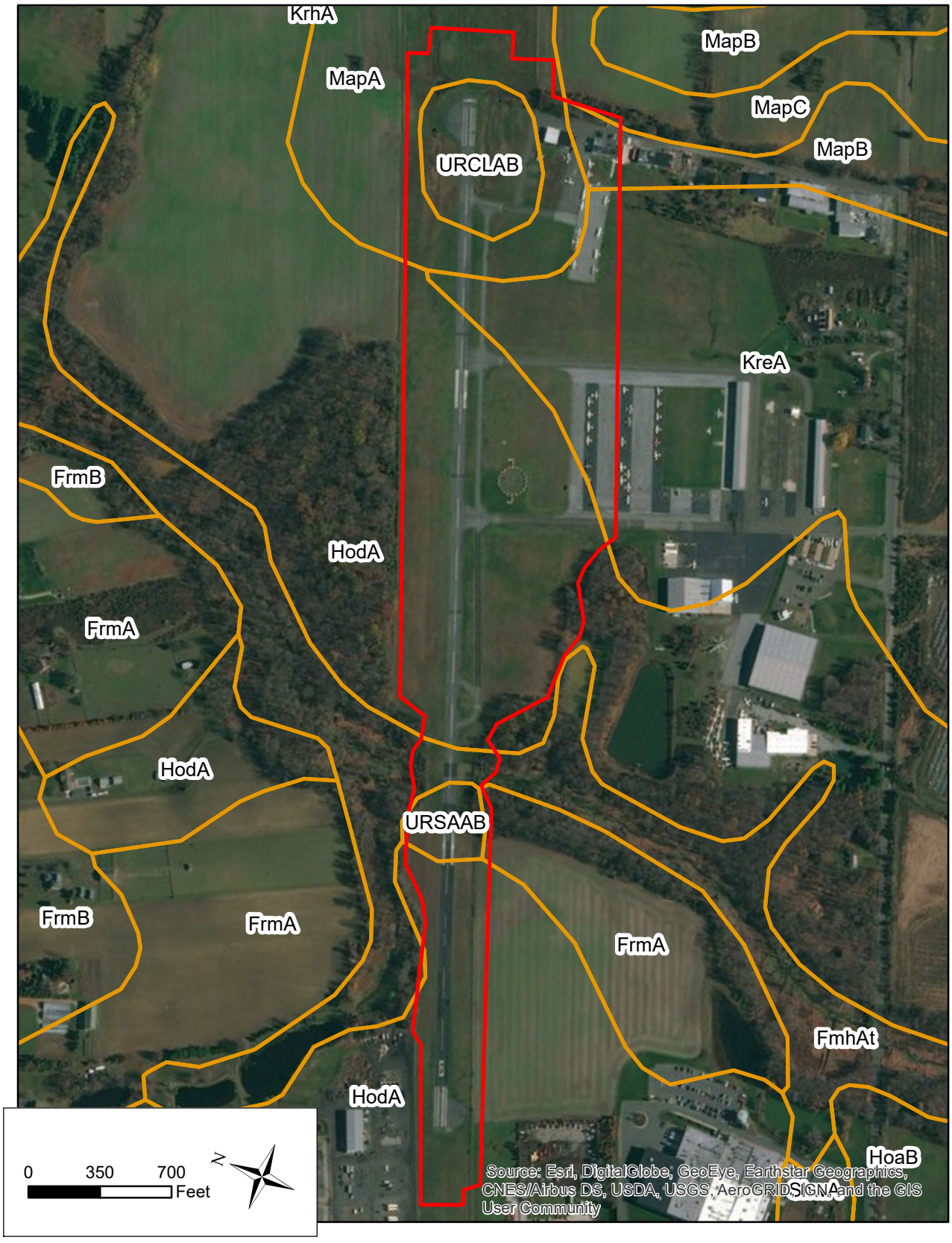


Figure 2.3. Mapped soil units in the project area.

3. PREVIOUS RESEARCH

Background research included a review of archaeological site records and maps at the New Jersey State Museum, Pinelands Commission, and the New Jersey Historic Preservation Office (NJHPO) as well as the NJHPO National and New Jersey Register of Historic Places files and filed cultural resource survey reports. No archaeological or architectural resources listed in or determined eligible for the New Jersey or National Registers of Historic Places are located within the project APE. Dozens of Pre-Contact Period archaeological sites have been recorded along Masons Creek and its tributaries, however. Table 1.1 lists those that are within just a half mile of the present project area. The sites were recorded beginning in the early 20th century and include excavated sites as well as many known through surface finds. One, the Koens-Crispin Site (28-Bu-5), is National-Register eligible. Additional highly significant sites in the wider vicinity include the Logan/Bobbies Run Sites (28-Bu-214 and 215, with Paleo-Indian components) in Lumberton and the Savich Farm site in Marlton, each about 4 miles distant from the project area.

Previous research is summarized below, beginning with the most pertinent cultural resource management (CRM) surveys.

Richard Grubb & Associates conducted a cultural resource survey in 1999 for a proposed expansion, including three alternatives, to the South Jersey Regional Airport (Leynes et al. 1999). That survey included a Phase IA archaeological assessment and a survey of architectural resources within respective Areas of Potential Effect (APEs) that fully encompass the present APE. The survey assessed the project area as having high potential for the presence of Pre-Contact Period archeological resources based on the proximity of known sites and the environmental setting along Mason's Creek. Two sites, 28-Bu-62 and 63, were noted within the airport tract (see further discussion below). The survey also identified seven historic properties, none of which were considered individually eligible for listing in the National Register. An addendum to the 1999 survey evaluated the historic farmsteads that had been identified for potential eligibility as elements within a rural agricultural district (Richard Grubb & Associates 2000). The subsequently defined Lumberton Rural Historic District received an Opinion of Eligibility for inclusion in the National Register in 2001. The district, however, does not extend into the present project area: its western boundary lies 0.4 miles to the east of the APE.

Leynes et al. mention earlier CRM surveys within 2 miles of the airport, including investigations for a development project to the northwest that identified Archaic and Woodland materials, though the sites were not considered to be significant (MAAR Associates 1984, cited in Leynes et al. 1999). One of the sites, 28-Bu-165, was further investigated by Mounier and Cresson and a thermoluminescence date of 750 B.C. +/- 270 was obtained (1988:8, cited in Lyenes et al. 1999).

Other cultural resource surveys nearby include Phase IA (Tomaso 2009) and IB (White 2010) studies for the Adams/Murphy Tract, a proposed residential subdivision located approximately 0.37 miles west of the present project area. Moderate to high potential for archaeological resources, based on environmental setting and the proximity of 13 previously recorded Pre-Contact sites. This potential was addressed through a program of shovel testing, which yielded only 3 Pre-Contact artifacts. No sites were identified and no further work was recommended.

A survey was completed recently in Lumberton Township for the Wellington Farms development project, located 4 miles northeast of the present project area (White and Wiles 2016). Testing confirmed the survival of the previously-recorded Pre-Contact archaeological sites 28-Bu-214 (Logan/Bobbies Run 1) and 215 (Bobbies Run 2), representing Paleo-Indian through Archaic occupations, within the

Table 3.1.
Previously Recorded Pre-Contact Sites Within 0.5 Mile of the Project Area
(in order of proximity)

Site # and Name	Description	Source
28-Bu-62 Adamski or Airpark-N; 28-Bu-324 Fenimore Road So. (ISS); Pinelands #F78	These all appear to reference the same site, on the east side of Mason's Creek, adjacent to north of (and likely overlapping) the airport project area. Situated on a knoll in the orchard that once lay north of the airport property, now wooded. ISS reported flakes and pottery. Described in 1984 as located in an area of "crop rows," yielding fire rock and flakes. Artifacts from 28-Bu-324 include argillite points, drill, scraper, hammerstone, pottery.	Indian Sites Survey (1938); Cross (1941, Vol. 1:245); NJSM Site Files; Pinelands Commission Site Files.
Pinelands #A72	Not described, located immediately west of the project area at a possible periglacial basin feature.	Pinelands Commission Site Files and map (recorded by Jack Cresson).
28-Bu-63 Mengel Pinelands #F79	On east side of Mason's Creek, north of Stacey Haines Road. Scattered lithic flakes, a "bola stone." Possibly the same site as Q59.	Indian Sites Survey; Cross (1941, Vol. 1:245); Leynes et al. (1999); NJSM Site Files (also Pinelands Commission Site Files and map, Site F79, recorded by Cross).
Pinelands #Q59	Surface finds within small area spanning Stacy Haines Road. Site form indicates points found but no temporal period is noted. Recorded as Holmdel fine sandy loam, 0-2% slope, and 10 meters from a thermokarst basin. Possibly the same site as 28Bu63.	Pinelands Commission Site Files and map (recorded by Hutting).
Pinelands #A301	Not described.	Pinelands Commission Site Files and map (recorded by Jack Cresson).
28-Bu-212 Mason's Creek East	Surface surveyed in 1984 – located on "sand ridge" east of Mason's Creek. Described as Late Archaic camp with many diagnostic artifacts affiliated with Koens-Crispin cultural complex. See also Pinelands sites C49-52 and Q60 (adjacent, possibly same site?).	NJSM Site Files (recorded by Arsenault).
Pinelands #s C49-52	Surface finds on terrace east of Mason's Creek. Soils recorded as Holmdel loamy sand, 0-5% slopes, moderately well drained. Middle through Terminal Archaic points. See also 28Bu212 (adjacent, possibly same site?).	Pinelands Commission Site Files and map (recorded by Meyer, Cresson, and Regensburg).
28-Bu-5 Koens-Crispin Includes Pinelands #C55	Late Archaic site excavated in 1914 and again in 1937-38 on the west side of Mason's Creek. Evidence of long-term, possibly semi-permanent occupation, ceremonialism. Fire pits and artifact caches recorded. Artifacts include projectile points, knives, scrapers, drills adzes, axes, hammerstones, netsinkers, pestles, ceramics, and red ochre decorated objects. Site believed to extend for 2000' along the creek, at 8-10 feet above creek level.	Hawkes and Linton 1916; Indian Sites Survey (Koens Farm and Crispin Farm); Cross (1941, Vol. 1:81-90); Pinelands Site Files and map (recorded by Regensburg); Certification of Eligibility for the National Register of Historic Places, February 18, 2014 (NJHPO Project #13-0493-1).
Pinelands #C54 (or part of Koens-Crispin)	Surface survey recorded by Raymond Powell. Noted as near the Koens-Crispin Site, and based on mapping overlaps with that site's northern extent, but recorded separately as a Late Woodland site. No artifacts noted on site form. (This location corresponds to the northernmost area excavated by Cross, where "artifacts recovered…were quite different from those found in other parts of the site in that the percentage of flinty materials was considerably higher, pottery more abundant, better fired and more finely impressed" [Cross 1941, Volume 1:83].)	Pinelands Commission Site Files and map (recorded by Powell).
Pinelands #Q60	Surface finds immediately south of C49-52, points and 4 axes. Recorded as Holmdel loamy sand, 0-5% slopes, moderately well drained, 17 meters from a basin. See also 28Bu212 (adjacent, possibly same site?).	Pinelands Commission Site Files and map (recorded by Hutting and Cresson).
Pinelands #C53	Surface finds in field. Soils recorded as Marlton fine sandy loam, 2-5% slope, well drained. Basins recorded 66 and 200 feet away. Late Archaic points.	Pinelands Commission Site Files and map (recorded by Meyer, Cresson, and Regensburg).
Kilpatrick	Fields south of Stacey Haines Road, overlapping with site or sites C49-52, Q59-60, A301, Bu-212 and Bu-5 listed above. Reported a burial in vicinity of C53. Collection includes large number of points, whole pots.	Interview with Karl Kilpatrick, reported in Bianchi and Howson 2012.
Solar Farm	Testing for solar farm on south side of Stacey Haines Road yielded lithics probably associated with the previously recorded site or sites C49-52, Q59-60, A301, Bu-212 and Bu-5 listed above.	Bianchi and Howson 2012.

development project's APE. Lithics including debitage, FCR, and tools were recovered during testing; the project was subsequently modified in order to avoid these highly significant sites. 28-Bu-214 had previously yielded (from surface collecting) Plano and Dalton points, including among the latter items made of raw materials from sources 600 miles distant in the Midwest (Stanzeski 1996).

One cultural resource survey that has relevance for the current project was not filed with the NJHPO. Limited archaeological shovel testing within areas targeted for clearing/tree removal was conducted in advance of construction of the solar farm located across Stacey Haines Road from the airport (Bianchi and Howson 2012). The tests yielded Pre-Contact lithic artifacts (including 16 tools, among them a Koens-Crispin type point; 66 flakes; 5 cores; and 6 pieces of fire-cracked rock) of various raw materials, from strata with mixed historic material and from two units in sub-plowzone unmixed contexts. The finds are considered to be associated with the previously-recorded overlapping and adjacent sites, including the Koens-Crispin Site (see below). The solar farm investigation also included an interview with a local collector who allowed the researchers to photograph his large collection of lithics collected along Masons Creek and farm fields south of Stacey Haines Road, along with three whole pots and an obsidian blade which were reportedly from a burial. The solar panel installation eventually was reduced to a smaller area, excluded originally-proposed clearing/tree removal, and also avoided the general location of the reported burial. The area currently covered by solar panels was apparently not tested.

Most of the recorded archaeological sites in the project vicinity were identified well before the advent of CRM or by avocational archaeologists documenting sites based on surface finds. Table 3.1 indicates the range of professional and avocational archaeological exploration of the area and resulting picture of intensive Pre-Contact Native American use of this prime location.

28-Bu-62 and 28-Bu-324

The previously recorded sites 28-Bu-62 and 28-Bu-324 are the most pertinent to the present survey, as they abut and may overlap the APE.

Site 28-Bu-62 was originally recorded for the Indian Sites Survey in 1938, and it is included in the list of sites published from that survey by Dorothy Cross (1941, Vol. 1:245). It was described by the surveyor, E. J. Morton, as situated on the western end of an apple orchard, on the north and west facing slopes of a knoll, and bordered on the north and west by marshes. The area was approximately 350' by 400' and the site lay approximately 300' east of Masons Creek. See Figure 3.1 for a 1940 aerial view of the project area shortly after the ISS recorded the site, with the orchard clearly visible. Morton also mentioned that the soil was sandy and deeply eroded. Artifacts collected from the site included flakes, unspecified lithics, and pottery. The site was named "Adamski" for the property owner (the usual ISS protocol). In 1984, Joe Arsenault submitted a site registration form for the site, at which time it was registered as 28-Bu-62 and named "Airpark-N". Arsenault reported fire-cracked rock and flakes, and noted that "reports from other local collectors indicates that this is a large, multicomponent site." Neither the 1938 or 1984 surveys included excavation.

The coordinates noted in NJSM records for 28-Bu-324 (called "Fenimore Road South") place the site in the ISS grid square adjacent to the south of the one containing 28-Bu-62 and adjacent to the north of the one containing site 29-Bu-63 (the latter lies east of Masons Creek on the north side of Stacey Haines Road). The coordinates for 28-Bu-324 are not found in the published list (Cross 1941, Vol. 1:245) of ISS sites and although the collection from the site is housed at NJSM there is no associated ISS map on file. The NJSM catalog of material recovered from site 28-Bu-324 includes 6 points, a drill, a scraper, a hammerstone, and 8 pottery sherds.

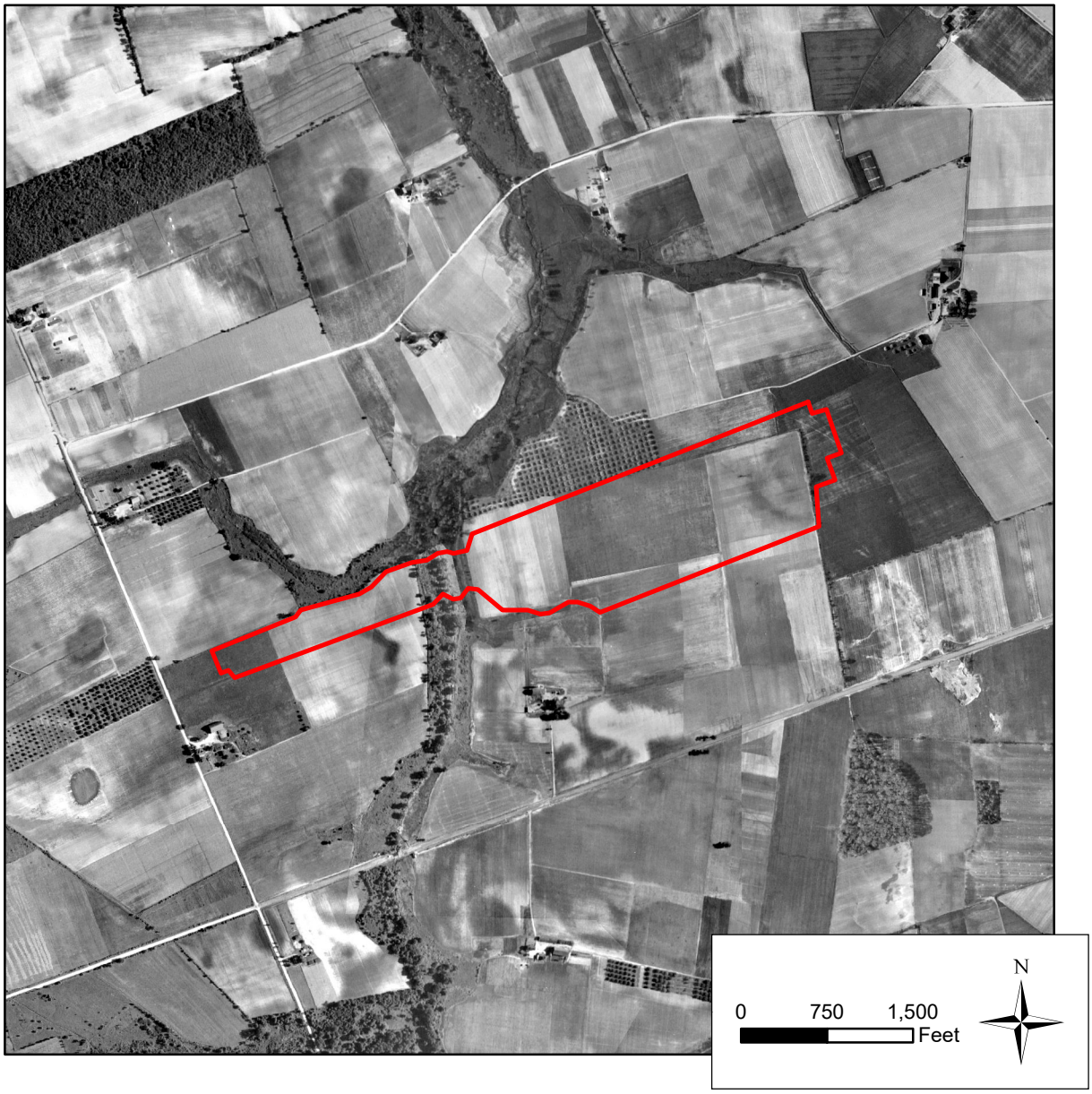


Figure 3.1. 1940 aerial view of the project area. Source: historicaerials.com.

Koens-Crispin

The most significant site in the area, Koens-Crispin, located on the west side of Mason's Creek to the south of the present project area, warrants discussion here. The site was first described by Hawkes and Linton over a hundred years ago (1916) and was revisited by Cross for the Indian Sites Survey in the late 1930s. It is the type site for Koens-Crispin projectile points and gives its name to the most prominent southern New Jersey "cultural complex" of the Susquehanna Tradition, which migrated from the southeast up the entire eastern seaboard beginning about 2500 B.C. (Mounier 1982:82). The complex is believed to have been of relatively short duration, dating to the end of the late Archaic Period around 2000 B.C. Archaeological evidence suggests that Koens-Crispin site residents participated in the regional network of communication, transportation, and exchange that characterized the Late Archaic in New Jersey. The culture was distinctive, however, in its mortuary and ceremonial aspects, including artifact caches containing its signature style of "bannerstones" (atlatl weights). The archaeological attributes of the complex are summarized as follows by Burrow (1997:41):

- the use of a distinctive type of stone point of "broadspear" configuration, closely related in form to other regionally-occurring types…of the Susquehanna tradition. The Koens-Crispin point is thought to be one of the earlier types of broadspear in the Northeast and Mid-Atlantic…
- the employment of spear throwers counterbalanced with finely-crafted atlatl weights frequently made of imported stone materials…
- the use of stone shaft smoothers in great quantities
- the use of cobbles for the production of celts, adzes, and other heavy woodworking tools
- the collection of naturally occuriring petrified wood for unknown, but possibly shamanistic, purposes
- the occasional use of steatite and ceramic vessels (possible, but not certain)
- an elaborate funerary ritual involving cremation followed by burial with offerings of artifacts, ecofacts…, and red ochre

The Koens-Crispin Site itself, as are two other sites of the culture complex (the Savich Farm Site in Marlton and the Red Valley Site in Monmouth County), is considered to represent a major habitation site, a fall/winter base camp that was part of a regional subsistence/settlement system (see Wall et al. 1996:118-119; Pagoulatos 2006). The Koens-Crispin site has been interpreted as a cremation cemetery, based on similarities with the National Register listed Savich Farm Site, located 4 miles to the southwest (Mounier 1982:82). No human bones were recorded during excavations at Koens-Crispin, and its excavators did not discuss the possibility of a cemetery. Mounier (2006:6) has concluded that "early researchers failed to deduce the function of the Koens-Crispin and Red Valley sites as cemeteries, apparently because the human skeletal material was scarce," but that the similarity of the suite of artifacts to Savich Farm points to their use as burial places."

The 1916 excavations covered a relatively small area - approximately 50 by 60 feet. A large fire pit and 20 artifact caches in 3 "roughly parallel rows" around it, plus several additional small fire pits, were

unearthed. The artifacts recovered are well illustrated in the site report (Hawkes and Linton 1916). The 1937-38 Cross excavations were more extensive (29,295 square feet in total), including 20 test trenches surrounding the earlier site as well as trenches in two other locations to the north and southeast (the latter containing 6 pit features and 40 artifact caches), yielding over 3,000 artifacts. Lithic artifacts included points, knives, scrapers, drills, axes, celts, an adze, hammerstones, anvils, netsinkers, rubbingstones, pestles, a large number of shaft smoothers, small hoes, a quartzite ball, sinewstones, a whetstone, and bannerstones. Ceramics included paddle-cord finished sherds, plain smooth sherds, and plain rough sherds. As in the Hawkes-Linton assemblage, the vast majority of lithics were of argillite (2,037 of the 2,605 total specimens), though the axes, celts, hammerstones, and smoothers were mainly of sandstone. Finds from the Cross excavation are illustrated in Plates 33 through 38 in Archaeology of New Jersey, Volume 1.

It is important to note that the Koens-Crispin site area was exceptional in that it had never been cleared for farming, and preservation was excellent. The present runway expansion project area lies largely within former farm fields, and both plowing and erosion would have impacted site preservation. Most of the other recorded sites in the immediate area (see Table 3.1) are also within farmed fields or former fields, and have produced material indicating Archaic and Woodland Period occupation from surface collections alone.

It is also worth noting that the Woodland Period is also represented in the vicinity by a Meadowood Phase (Early Woodland) blade cache collected in the late 19th century from a site “near Lumberton,” now at the University of Pennsylvania Museum of Archaeology and Anthropology (Bello et al. 1997). In addition, a local collector reported a burial containing possible Middle Woodland items including whole pots and an obsidian blade, found near the present project area in a farm field on the south side of Stacey Haines Road (Bianchi and Howson 2012).

4. HISTORIC-PERIOD LAND USE

The project area lay within the 2,000-acre Dinsdale holding from 1683 through the late 18th century (see Leynes et al. 1999:7-10 for an overview of the historic period), after which it was sold into smaller parcels. Sawmills and forges were built along the Rancocas and Lumberton had become an important shipping point linking the Pinelands with Philadelphia by the end of the 18th century. By 1849, however, shipping had already declined along with the sawmills and ironworks, the Rancocas could not accommodate larger steam vessels, and the Camden and Amboy Railroad would soon supplant water transport of goods and passengers (Ibid.). The immediate project area had always been strictly agricultural, and continued to be. Figures 1.6 and 1.7 show the area in 1849 and 1876; see also Figure 1.5 for an aerial photograph from 1940. As can be seen, Stacey Haines Road, Ark Road, and Fenimore Road surrounding the future airport were in place by 1849, and the project area was ringed by farmsteads and was cultivated (excluding the creek bed) through the mid-20th century.

The 1849 Otley and Whiteford map of Burlington County shows a farmstead with two buildings, owned by S[amuel] Evans (Figure 4.1) standing within the project APE. However, subsequent maps, including the 1876 Scott Atlas (Figure 4.2), depict this farmstead in a slightly different location, further west and south, outside the APE. This farm complex was standing until at least the 1970s, and is clearly seen on the 1940 aerial (see Figure 3.1), situated well outside the impact area for the project. Although no farmstead structures were sited within the project area, historic-period artifacts recovered in the archaeological testing for this project (see Section 5 below) may be redeposited from the Evans farmstead or from one of the other adjacent 19th-century farms visible in Figures 3.1, 4.1, and 4.2. Because the material is extremely fragmentary, is not from primary contexts, and has negligible research value, it was not deemed necessary to conduct primary research (e.g. using deed maps, chains of title and probate records, or census enumerations) for the historic properties for the purposes of developing a detailed historic context.

There are no standing buildings pre-dating the mid-20th-century airport within the present project's APE or within the airport property. The airport was developed in the late 1950s as the Burlington County Airpark (Leynes et al. 1999). It has undergone expansion over the decades, including extension of the runway westward (so that it now crosses Masons Creek, which flows beneath it in culverts). Figures 4.3 through 4.5 are historic photographs that hang on the wall at the airport terminal, showing the early years of operation. The last historic structure standing within the airport property (see Figures 4.1, 4.2, and 4.4), the Samuel Evans house, was demolished sometime between 1981 and 1995. Its location is the present site of the Air Victory Museum (see Figure 1.3).

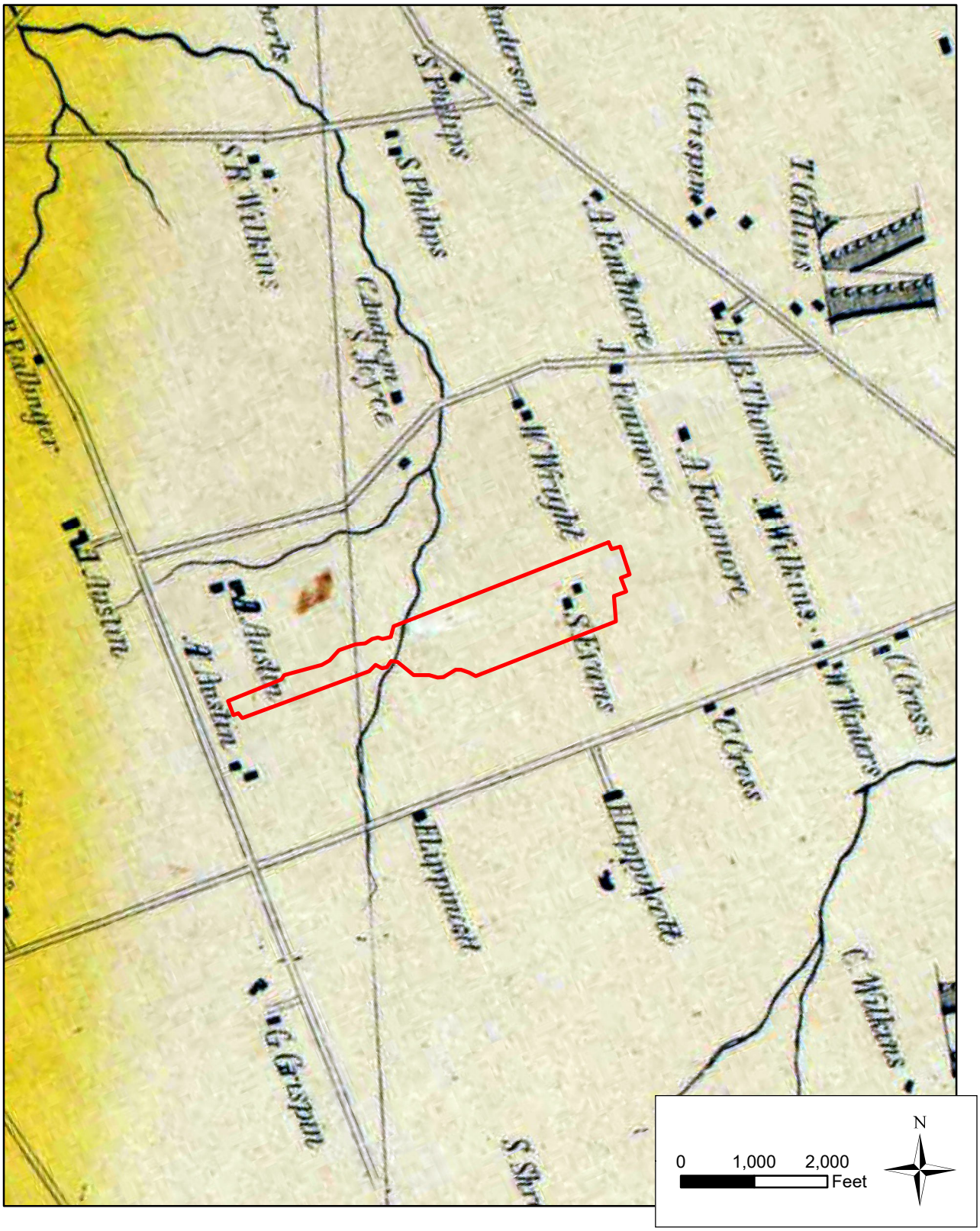


Figure 4.1. 1849 Otley and Whiteford map of Burlington County with the project area shown. Note that the "S. Evans" farmstead is shown in a different location on subsequent maps.

Figure 4.2. 1876 Scott Atlas of Burlington County showing the project area.

Figure 4.3. Late 1950s photograph showing the earliest configuration of the South Jersey Regional Airport. The view is to north, with Stacey Haines Road crossing at the bottom of the photo. Source: South Jersey Regional Airport.

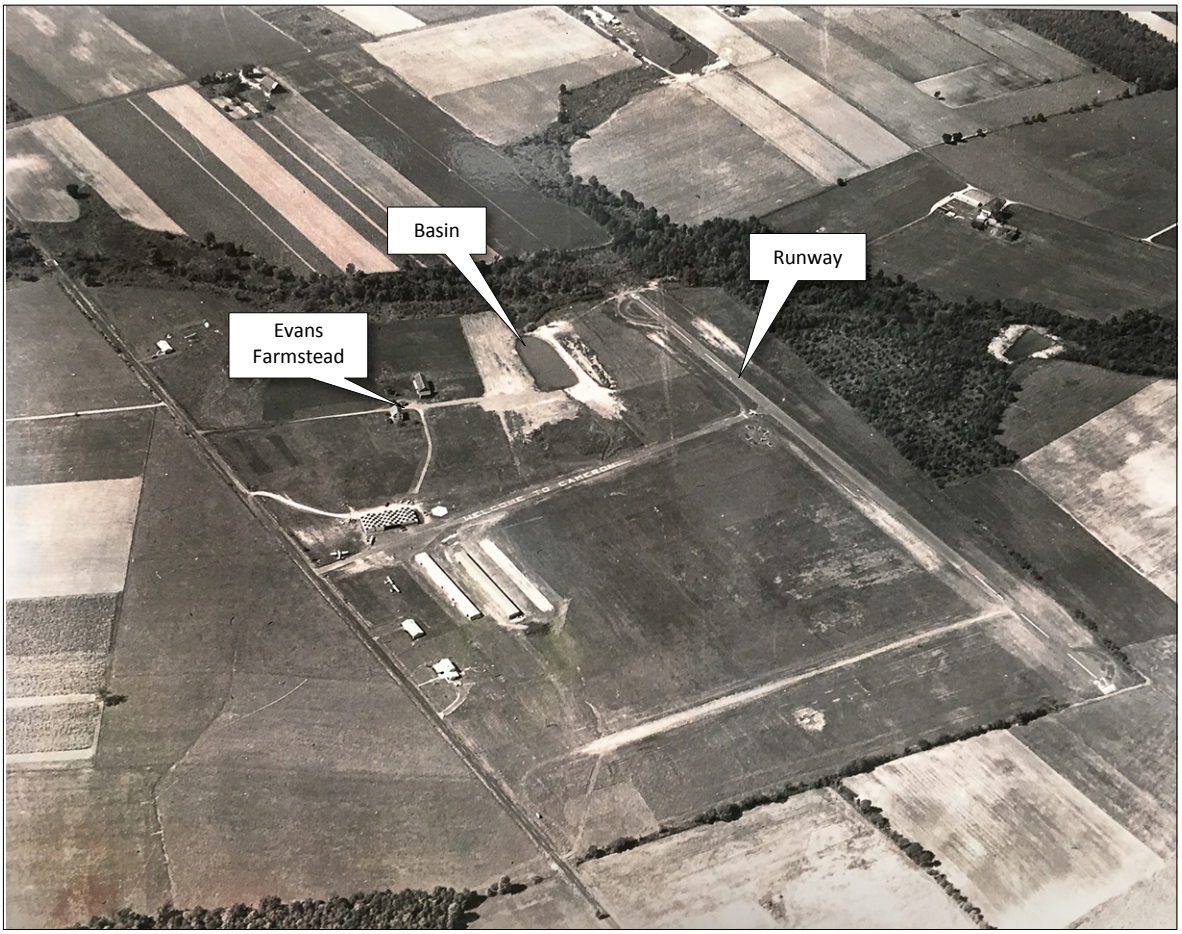


Figure 4.4. Circa 1960 photograph of the South Jersey Regional Airport. View is to northwest, with Stacey Haines Road running diagonally at left. The painted lettering on the taxiway reads “Welcome to Cameron” (the reference is unknown, and it would quickly be re-painted). Masons Creek formed the west edge of the developed airport at this time; the runway terminated on the east side of the creek. A swath of the creek bed vegetation had been cut back for visibility. Note evidence of grading along the runway and large basin that had been excavated. Source: South Jersey Regional Airport.

Figure 4.5. Late 1960s photograph of South Jersey Regional Airport. View is to northwest, with Stacey Haines Road running diagonally at left. The taxiway lettering now reads "Welcome to Burlington Co. Airpark." Industrial shops had been built along the east side of the property. Masons Creek had been bridged; the expansion of the runway westward was in progress by 1970. Source: South Jersey Regional Airport.

5. FIELD INVESTIGATION

5.1. Phase I Field Testing

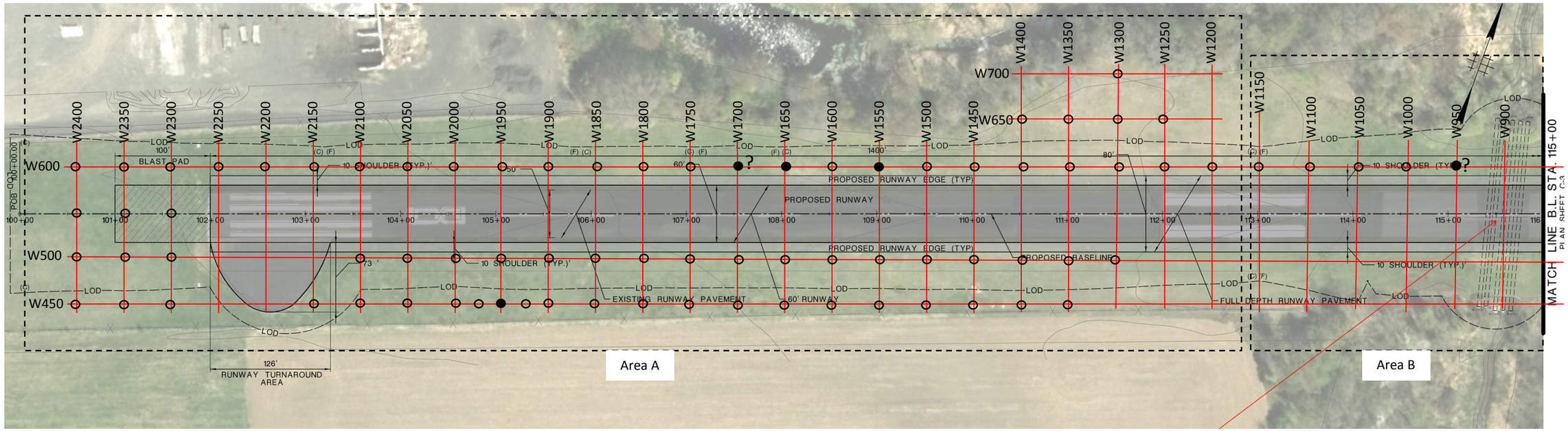
Phase I field testing included excavation of a total of 284 shovel tests (STs) with the majority placed at 50' intervals along a series of east/west transects spaced 50' apart. Where Pre-Contact Period material was recovered from either plow zone or subsoil deposits, additional lateral tests were usually placed at 25' intervals in most cardinal directions within the APE. Figure 5.1 (A and B) shows the site grid and all test locations.

The project datum (North 0/West 0) was established in a paved, semi-circular airplane "turnaround" area located adjacent to the north-south taxi lane at the southeast corner of the tested area. A north-south baseline was established 25' west of the north-south taxi lane in order to avoid electrical lines. Surveyed transects were subsequently laid-out to the west at 100' intervals from the baseline, ending at a point 750' north of datum. While most transects measured between 700' to 1100' in length, transects flanking the north and south sides of the runway (the N600 and N500 lines, respectively) measured 2,400' in length. No attempt was made to test paved areas. Most of the N550 transect, which runs along the centerline of the main runway, was not examined; a 150' area at the west end of the runway on this line was tested.

Shovel test units measured approximately 1' by 1.5' with the northeast corner located at the grid coordinate. Units were excavated by natural soil strata, and were extended into subsoil; most were less than two feet deep. Most of the APE contained a plow zone underlain by subsoil, but some locations had overlying fill deposits and in some locations disturbances from cutting and filling were noted.

The present project includes the western 2,400' of the South Jersey Reginal Airport's main runway, which crosses Masons Creek, and the adjacent fields located east and west of the creek and north and south of the runway. Both the 50'-wide runway and a 20'-wide taxi lane are paved with asphalt, while areas to the north and south of the runway consist of generally level, grass-covered fields with a slight slope downward in the direction of Masons Creek. The runway's crossing of Masons Creek and its wide floodplain is marked by a pronounced dip in elevation. Masons Creek has been placed in a series of large-diameter aluminum culverts (Plate 5.1). Prior to the previous expansion of the runway, the west side of the slow-moving creek appears to have been a high bank. One additional topographic feature of note is an oval drainage basin located to the southeast of the runway's crossing of Masons Creek (see project plan sheet 7 in Appendix B). The basin appears to have been constructed within a former tributary of Masons Creek.

With the exception of an electrical distribution system for runway lighting, there are no utilities, such as water, gas, communications/fiber-optic lines, or drainage lines within the project area. Plans of the present runway electrical system on file at the South Jersey Regional Airport were examined prior to the start of fieldwork. Distribution lines were evidently installed in narrow "ditch-witch" trenches and flank both the north and south sides of the runway, the east-west taxi lane and along the west side of the north-south taxi lane. Electrical lines and junction boxes were installed at distances of less than 25' from the paved edges of the runway and taxi lanes. The junction boxes, which were set at ground level, have been obscured by the thick grass groundcover. The location and route of the buried electrical lines, a few of which were encountered during our fieldwork, are marked with caution tape.

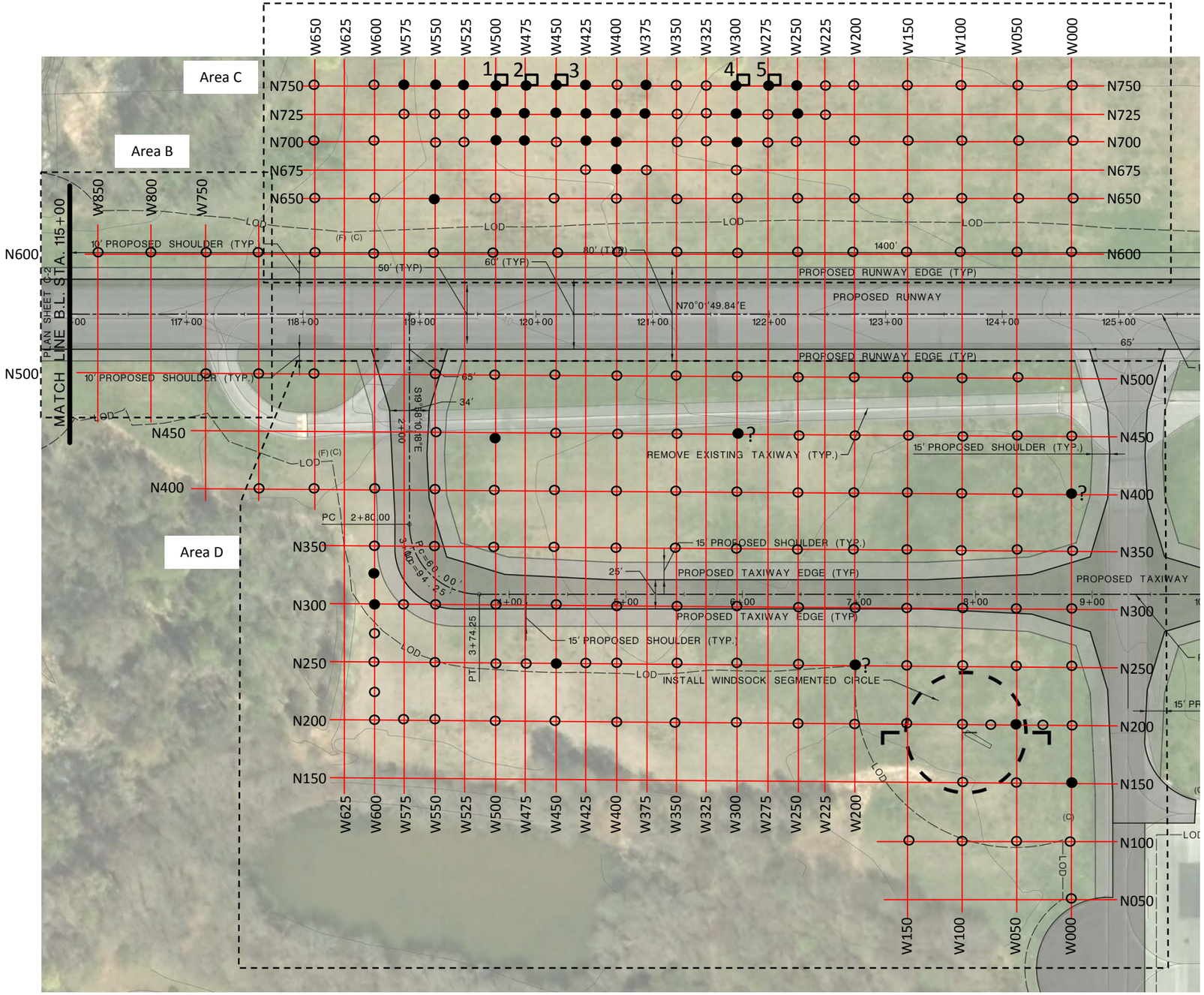


KEY (TEST UNITS NOT TO SCALE):

● SHOVEL TEST POSITIVE
FOR PRE-CONTACT ARTIFACTS

○ SHOVEL TEST NEGATIVE
FOR PRE-CONTACT ARTIFACTS

Figure 5.1.A. Archaeological test locations shown on draft project plan (west portion).



KEY (TEST UNITS NOT TO SCALE):

- ● SHOVEL TEST POSITIVE FOR PRE-CONTACT ARTIFACTS
- ○ SHOVEL TEST NEGATIVE FOR PRE-CONTACT ARTIFACTS
- ☐ 3' x 3' EXCAVATION UNIT

Figure 5.1.B. Archaeological test locations shown on draft project plan (east portion).

Plate 5.1. Masons Creek and culverts. View is toward southeast. Photograph: Jason R. Nargiz, September 2017 [NV5-1344.jpg].

For ease of description the project area had been divided into four Sub-Areas (see Figure 5.1.A and B):

A. West of Masons Creek - north and south of the runway (Station 100+00 to 113+00)

B. Floodplain and crossing of Mason Creek (Station 113+00 to 117+75)

C. East of Masons Creek - north of runway (Station 117+75 to 124+75)

D. East of Masons Creek south of runway (Station 117+50 to 124+75)

Sub-Area A

Sub-Area A, a level, grass-covered area that flanks the SJRA runway to the north, south, and west, measured approximately 1300' in length (Plates 5.2 and 5.3). Elevations in the area west of Masons Creek range between 40' to 45' (ASL) with a slight slope downward to the east. A more pronounced slope was encountered along the southeast side of the project Sub-Area. An area approximately 200' to 300' long was evidently graded during the west extension of the runway in 1970, as ground levels for an agricultural field directly adjacent to the south of the airport's property line are 3' to 4' higher (Plate 5.4). Also of interest was a crescent-shaped level field along the north side of the runaway between Stations 110+50 and 113+00. Located beyond any disturbances associated with the construction of the SJRA runway, this field flanks a low-lying marshy area and drainage adjacent to the north. This section of high ground is situated west of Masons Creek. Testing was offset 25' from the north and south edges of the runway to avoid the electrical system for runway lighting. An electrical supply line also extends along the south property fence line to a point approximately 800' east of the end of the runway's west end to a junction box (at Station 110+00). The buried warning tape for the utility line was uncovered in a few shovel tests. The electrical line extends west along the fence line to a point in Ark Road.

A total of 76 shovel tests were excavated along the north and south sides of the western portion of the runway within Sub-Area A. The majority of the test units were excavated along the North 600' and 500' transects, located 25' north and south, respectively, of the runways asphalt edge. A series of test units was also placed to the west of the end of the runway (STs 109-112, 151-156, and 201-204), as well as to the north (STs 219-222, and 247) and south (STs 97-108, and 113-119) of the above noted transects where space allowed placement of tests at 50-foot intervals.

In general, the soil stratification encountered across most of the area consisted of a thick sod and root mat in a brown/dark brown (010YR-4/3) loamy sand that measured between 0.5' and up to 1.0' thick. Underlying the plow zone was a more compacted yellowish brown (010YR-5/6) sandy clay loam, of which the top 0.25' to 0.5' was excavated.

Four Pre-Contact lithic artifacts (and a fifth possible artifact) were recovered in the area. One was an isolated Poplar Island-type projectile point from south of the runway (ST #0104 at coordinates N00450/W01950, Catalog# 233.P001) (Plate 5.5, specimen at left). The other lithic material includes three waste flakes from north of the runway in shovel tests that were 100' to 150' apart. Units placed within 25' of the Poplar Island point find failed to yield any pre-Contact material. All of the artifacts were recovered from a sandy loam plow zone stratum. No Pre-Contact material was recovered from sub-plow zone deposits. Finally a light scatter of historic cultural material, including household ceramic s, bottle glass, and construction materials was also present in the upper sod layer and plow zone.

Plate 5.2. Overview of Sub-Area A. Paved area in foreground is an airplane turning pad. Note line of trees and dip in runway in background, which mark the crossing of Mason's Creek. View is to east. Photograph: Jason R. Nargiz, September 2017 [NV5-1354.jpg].

Plate 5.3. Sub-Area A on the south side of the existing runway. Note generally level ground to north (right) and south (left) of runway. View is to west. Photograph: Jason R. Nargiz, September 2017 [NV5-1350.jpg].

Plate 5.4. Portion of Sub-Areas A and B, looking toward the southeast. Trees mark the floodplain of Mason's Creek. Note higher elevation of field to south (right) of chain-link fence. Photograph: Jason R. Nargiz, September 2017 [NV5-1347.jpg].

Plate 5.5. Prehistoric artifacts from Sub-Areas A, C, and D. Photograph: Jason R. Nargiz [NV5-9078.jpg].
Top: Poplar Island type projectile points
left: Sub-Area A, ST 104 (Cat #233),
middle and right: Sub-Area C (28-Bu-62) , EU 2 (Cat #1005) and EU 3 (Cat #1002)
Bottom: Incised or cord marked pottery from Sub-Area D, ST 55 (Cat #137)

Sub-Area B

Sub-Area B comprises the crossing and former floodplain of Masons Creek, a slow moving tributary of the south branch of the Rancocas Creek that drains to the north. Measuring approximately 475’ in length, the grass-covered area flanks the SJRA runway on the north and south in a narrow fill corridor. Elevations in the area range between roughly 35’ ASL at the location of the culverts to 40’ ASL, with slight slopes downward to the east and west in the direction of the creek. No utilities are located in the area besides the electrical system for the runway lights. The majority of the area has undergone cut and fill operations associated with the west expansion of the runway starting in 1970, which have effectively obscured the pre-airport landscape. Evidently, in this particular location, the west side of the creek was the high bank of Masons Creek and has undergone extensive grading and filling. This contrasts with a lower-lying, wider floodplain that was situated along the east side of the creek, resulting there in greater amounts of fill. The runway crossing of Masons Creek is marked by a pronounced dip, which will be eliminated as part of the proposed improvements for the present project (see Plate 5.2)

Twelve shovel tests, STs 132-133, and 171–179, were excavated along the north and south sides of the runway in the area of Masons Creek between Station 113+00 to 117+75. A series of tests along both the north and south sides of the runway in the area of the large diameter metal culverts were omitted due to the location of the buried pipes.

Strata that contained substantial amounts of stone, gravel, chunks of asphalt, and mixed soils were present in the area. Hydric soils and deposits of greensand and marl were encountered. Few if any of the test units encountered a plow zone deposit. The strata recorded in ST #173 on the east side of Masons Creek at coordinates N00600/W00800 was as follows:

A-01 - dark brown (010YR-3/3) loamy sand (0.00' to 0.30') - contained a few asphalt fragments
B-01 - brown/dark brown (010YR-4/3) loamy sand (0.30' to 0.80') asphalt - some mottling
C-01 - strong brown (7.5YR-4/6) clay loam mottled with very dark gray (010YR-3/1) clay loam (0.80' to 1.10') with lensing of soils
D-01 - olive gray (005Y -4/2) clay (1.10' to 1.20') hydric soil

A single, weathered argillite artifact, possibly a scraper, was recovered from the upper fill layers in ST #0175 (N00600/W00950). No Pre-Contact material was recovered from sub-plow zone deposits in Sub-Area B. As in Sub-Area A, the upper sod layer and fill layers contained a light scatter of historic cultural material, including household ceramics, bottle glass, and construction materials.

Sub-Area C

Sub-Area C, a grass-covered area that flanks the SJRA runway to the north, measured approximately 200’ ‘wide by 650’ feet in length, extending from Station 117+75 on the west to 124+75 on the east. While generally similar to the other areas, Sub-Area C contains the most varied topography within the project’s APE (Plate 5.6). In general, elevations in the area east of Masons Creek area range between 40’ to 45’ (ASL) with a slight slope downward to the west. A more pronounced slope was encountered at the western 125’ to 150’ portion of the area adjacent to the east bank and floodplain of the creek. The northern portion of Sub-Area C appears to be a slightly elevated knoll that extends to the north property line. A wide swath along the north side of the runway between Stations 118+00 and 122+75 appeared to be graded down to the level of the runway. Testing was offset 25 feet from the north edge of the runway to avoid the electrical system for runway lighting.

Plate 5.6. Sub-Area C, view toward west. Note drop in elevation at tree line in the background at Masons Creek. Photograph: Jason R. Nargiz, September 2017 [NV5-1338.jpg].

Archaeological testing sampled a thick topsoil/plowzone layer of dark brown (010YR-3/3) loamy sand that measured between 0.5' and 1.0'. Other than occasional fragments of cemented ironstone and small quantities of rounded quartz pebbles, the fine sand deposits contained few rocks or stones. Underlying the stratum was subsoil - a yellowish brown (010YR-5/6) sand subsoil that was excavated to a depth of 1.5' to 2.0' below the surface.

Pre-Contact lithic artifacts were recovered from the sandy loam plow zone and subsoil deposits between approximately Station 118+75 and Station 122+25 and north of our N675 transect. The artifacts consisted of flakes and one broken point tip. A scatter of historic-period artifacts was found throughout Sub-Area C in the plowzone. This material consists primarily of construction material with smaller quantities of household ceramics and miscellaneous small finds. A small quantity of faunal material, primarily shellfish remains, was widely scattered across the area. Tests were excavated at 25' intervals within the area that produced the lithics. As shown on Figure 5.1.A, the concentration of material was limited to a crescent-shaped area approximately 375' long and up to 150' wide that borders the SJRA north property line between stations 118+50 on the west and 122+25 on the east.

Sub-Area D

Sub-Area D was a generally level, roughly rectangular area that flanks the SJRA runway to the south and is situated west of the airport's north-south taxi lane (Plates 5.7 and 5.8). The area extends from Station 117+50 on the west to approximately 124+75 on the east. The project's APE also includes a paved holding/turnaround pad in the southeast portion Sub-Area D. Elevations in the grass-covered area range between 40' to 45' (ASL) with a slight rise in elevation along the north and central part of the area. The lack of a slope downward to the west in the direction of Masons Creek appears to be the result of recent landscaping. Photographic evidence indicates the west and southwestern edges of the area were substantially disturbed in conjunction with the extension of the runway and the excavation of the drainage pond to the southwest (see Figure 4.4 above and historicaerials.com). A shallow ditch that appears to be part of a remnant natural drainage was located in the southeast portion of the area near the paved pad (see Plate 5.7). The ditch extends to a wooded area that flanks Sub-Area D on the south and west.

Within the northern part of Sub-Area D and extending along the main runway's south side is a 17' wide taxi lane that branches off the runway and connects with the north/south taxi laneway. Utilities in the area include the electrical system for the main runway lighting and for the taxi lane. Evidence of the buried utility line's backfilled trench or the warning tape was uncovered in a few shovel tests situated along the south side of the taxi lane. Testing was offset 25' from the south edges of the runway to avoid the electrical system for runway lighting. Transect N500 was placed in the grass-covered infield between the main runway and the taxi lane.

While most of the area contained an intact plow zone, evidence for recent cutting and filling (sometimes to subsoil) was noted along the south and western portions of the area adjacent to the drainage basin. A thick topsoil/plowzone layer of dark brown (010YR-3/3) loamy sand that measured more than 1.0' was sampled over the majority of Sub-Area D. Besides the occasional fragments of cemented ironstone and small quantities of rounded quartz pebbles, the fine sand deposits contained few rocks or stones. Underlying the stratum was subsoil - a yellowish brown (010YR-5/6) sand subsoil.

Plate 5.7. Sub-Area D, view toward southeast. Photograph: Jason R. Nargiz, September 2017 [NV5-1359.jpg].

Plate 5.8. Sub-Area D. View is toward the northwest. Slight trough in center left of photo is a remnant drainage ditch. Photograph: Jason R. Nargiz, September 2017 [NV5-1364.jpg].

Six Pre-Contact lithic items, including five flakes (two of which may be non-cultural) and a single pottery sherd were recovered from a sandy loam plow zone in this Sub-Area. The pottery fragment was recovered in ST #0055 at N00300/W00600. It is an eroded, grit-tempered body sherd that measures less than 0.5" (see Plate 5.5, lower left). The exterior surface exhibited an incised or worn cord-wrapped stick decoration or treatment; the interior surface was not preserved. Photographic evidence indicates that the area in which the sherd was found was extensively disturbed as part of the extension of the runway and the excavation of the drainage pond. No shovel test unit contained more than a single Pre-Contact item. No definite Pre-Contact material was recovered from sub-plow zone deposits, although one piece of possible fire-altered rock was recovered from one of the lateral shovel test placed 25 feet from the test containing the pottery sherd.

As elsewhere, a scatter of historic-period artifacts was found throughout Sub-Area D in the plowzone. This material consists primarily of household ceramics and construction materials with smaller quantities of personal items and glass bottles and commercial containers. A small quantity of faunal material, primarily shellfish remains, was widely scattered across the area. Also included in the collection are a number of "clay pigeon" fragments, evidently associated with the use of the airport grounds for leisure or non-competitive trap shooting. The collection of household ceramics is composed overwhelmingly of red earthenwares and imported whitewares, such as whiteware and ironstone, ceramic types. A small quantity of creamware and pearlware was also present. The earliest manufactured historic ceramics include two Staffordshire slipware sherds, including a coggled edged rim fragment from a plate or platter and a plate or platter body sherd. These imported household ceramics, evidently in use for an extended period of time, may have been manufactured prior to the last quarter of the 18th century. The most interesting personal items include a small oval, Cu-alloy cufflink (or sleeve button) with a Masonic compass and square emblem, and a lead (Pb) and copper (Cu) alloy reed plate from a pitch pipe (Plate 5.9). This type of cufflink was constructed of two disks, the faces of which were often decorated, that were joined by wire links attached to a shank on the back of the button. The button face may have been silver or gold plated. According to Noël Hume the oval-shaped button face type dates to the second half of the 18th century (Noël Hume 1961:383). While it is not possible to attribute the assemblage of historic material to a particular individual(s) or local residents, such items are reflective of individual membership in voluntary organizations and social/religious groups.

Summary of Phase I findings

A concentration of Pre-Contact lithics was identified in an area to the north of the runway between approximately Stations 118+75 and 122+25 (to the north of the current limit of disturbance line as shown on the draft plans, Appendix B, sheet 7). Artifacts were recovered from both plow zone (n=42) and sub-plow zone (n=18) contexts. Included in the assemblage are a variety of waste flakes (primarily quartz and jasper, but argillite, chert, and quartzite were also represented) from tool manufacture/ maintenance and altered cobbles (primarily quartz), some of which may be the result of the more recent agricultural use of the area. A single argillite point tip was recovered. A small quantity of faunal material, primarily marine shellfish, was also recovered from the area, but this material may be from the historic scatter. No Pre-Contact pottery was recovered from any of the STs in this portion of the APE. Based on the Phase I testing, additional investigation of the site identified in Sub-Area C was undertaken (see below).

Additional pre-Contact archeological materials were found in several units across the site, but these were from disturbed contexts or were isolated finds. Included are a single pottery sherd, waste flakes (n=11) and a single mid-to late Archaic Period projectile point. The point, a Poplar Island type, was

Plate 5.9. Historic artifacts from Sub-Area D. Left: reed plate from a pitch pipe made of lead and brass (Cat #122). Right: Cu alloy cufflink with Masonic symbols of compass and square. Additional face marks are illegible; unmarked, missing braised loop shank (Cat #114). Photograph: Jason R. Nargiz [NV5-9079.jpg].

manufactured of argillite(?). All artifacts were inventoried and identified as to function and material (see Appendix D.1 and D,2). No further investigation of the find locations outside of the identified site was recommended.

The historic-period items recovered from shovel tests were generally very small and highly fragmented. The condition of the material is indicative of a secondary deposit and/or the use of seasonally cultivated farm fields for scattered disposal over a long period. Subsequent filling and disturbance in the area associated with the post-agricultural use of the property, including the establishment and expansion of the airport, has introduced a variety of cultural material. Most of the artifacts date from the second quarter of the 19th century through the early 20th century, and as they are not from primary contexts they have little research value. A few earlier items probably represent "heirloom" personal objects (such as the cuff link) or durable household items. It is concluded that no historic-period archaeological site is present within the APE and that the artifact collection does not require analysis beyond the basic inventory (Appendix D).

5.2 Supplemental Testing

Five 3' x 3' units were hand-excavated within the area where Phase I shovel tests (STs) yielded concentrations of Pre-Contact artifacts. Based on the spatial distribution of material from the STs, it was considered likely that the site extends north of the airport fence. In fact, the site is interpreted as a portion of previously-identified site 28-Bu-62 (see Section 3 above and the conclusions to this report in Section 6 below). The supplemental tests targeted the northern border of the present project area, with all excavation units placed on the established grid along the N750 line (see Figure 5.1). Test units were placed to examine what appeared to be two discrete concentrations of material.

Temporary datum points for each test unit were placed at the following coordinates (at the northeast corners):

EU 1 - N00753/W00497
EU 2 - N00753/W00472
EU 3 - N00753/W00447
EU 4 - N00753/W00297
EU 5 - N00753/W00272

In general, the soil stratification was fairly consistent across the area encompassed by the test units, though the depth (thickness) of the plow zone did increase from west to east (Plates 5.10 through 5.12 and Figures 5.2 and 5.3). The sod and topsoil were composed of a consistent dark brown (010YR-3/3) loamy sand, designated as stratum A, and usually measured less than 0.5' thick. Underlying stratum A was a thick layer of the brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/4) loamy sand, the plow zone deposit, labeled stratum B in the field. The transition between the topsoil and plow zone was gradual and usually marked by an increased amount of lighter sand mottling. Stratum B measured between 0.5' and 0.75' thick.

Each of the units was excavated into culturally sterile subsoil, which was a yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) loamy sand. Arbitrary 3" levels were excavated within subsoil deposits. In most units, the first arbitrary level represents a transitional layer between the plow zone and the subsoil. Plow scars, extending in an east-west direction, were noted in EUs 1 and 4. All test units were excavated to a final depth of approximately 1.5' to 2.0' below the unit datum.

Plate 5.10. North wall profile of Excavation Unit 1. Note mottling and the sharp break between the plow zone and subsoil strata. Photograph: Jason R. Nargiz [NV5-1449.jpg].

Plate 5.11. North wall profile of Excavation Unit 3. Photograph: Jason R. Nargiz [NV5-1445.jpg].

Plate 5.12. West wall profile of Excavation Unit 4. Note the depth of plow zone and fine silt/clay banding in subsoil. Photograph: Jason R. Nargiz [NV5-1460.jpg].

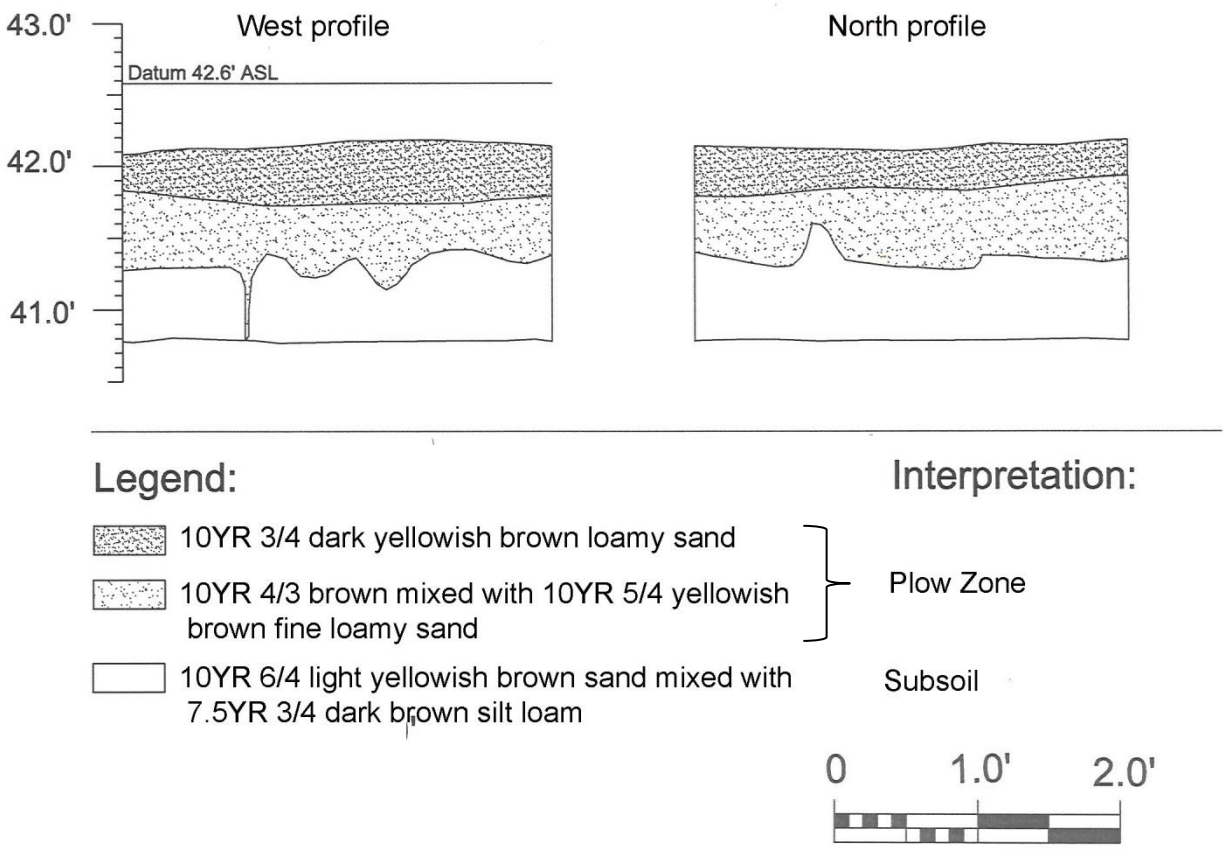


Figure 5.2. Profile of west and north walls, Excavation Unit 1.

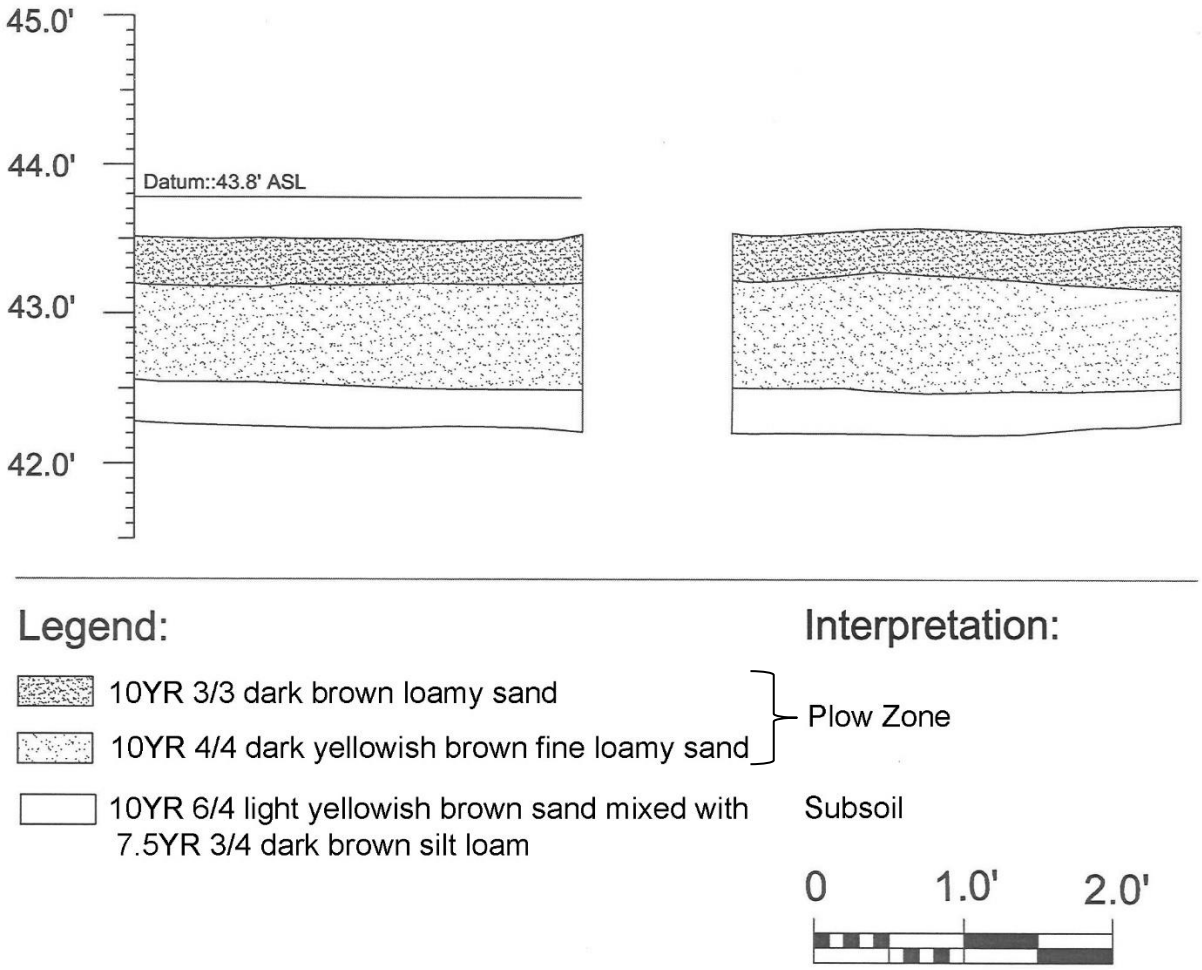


Figure 5.3. Profile of east and south walls, Excavation Unit 5.

A single sub-plow zone soil stain was uncovered in EU 3 at a depth of 1.5'. The roughly circular deposit, designated stratum D in that unit, contained a slightly contrasting soil composed of a dark yellowish brown (010YR-3/4). The base of the deposit, which measured 0.3' thick, was irregular shaped and became mottled with depth, ending in the deposit's southwest quadrant. A water-worn, possible Pre-Contact quartz waste flake was recovered from stratum D. We have interpreted the soil stain as a rodent burrow or a decayed root.

Artifacts recovered, including both those from the STs excavated for the Phase I and those from EUs 1 through 5, are summarized in Tables 5.2 and 5.3. As noted, 67% of the lithics were from the upper stratum (sod and plow zone) and 33% were from the lower stratum (transition and subsoil). Non-utilized lakes were categorized as primary, secondary, tertiary, blocky fragments, or unidentifiable. Flakes made up 84% of the artifact assemblage from the upper stratum and 86% of the material from the lower stratum. Table 5.3 breaks down the assemblage by raw material, and relative quantities are shown in the graphs in Figure 5.4. The graphs also compare the upper and lower strata in terms of raw material representation. Although some variation is observed (for example the percentages of chert and quartz items are higher from the transition and subsoil stratum), the counts are too small overall for further analysis.

Within site 28-Bu-62, four tools were recovered from the sod and plow zone component, including two argillite Polar Island projectile points. These objects were recovered from EUs 2 and 3. They each measured 0.6" wide at the shoulder, and were 1.5" and 1.4" long, respectively (see Plate 5.5). Other stone tools include a tip of a third argillite point found in ST 256 (N00725/W00450) and a possible argillite biface from EU 1. The point tip appears to be from a point with a broader blade than the Poplar Island points (based on the angle of the point) and is possibly a Koens-Crispin-type. The possible biface was weathered and eroded. A small quantity of fire-cracked rock (n=4) and a single possible core tool – a quartz cobble with a flaked edge – were also recovered. The flaking along the edge of the small cobble (1.5" OD) may not be cultural, but rather the result of plowing. A single possible, sand tempered, pottery fragment was recovered from the plow zone within EU5. Both surfaces of the thumbnail-sized (<0.5") sherd are eroded, and it may not be cultural.

Pre-Contact lithic tools (n=4) recovered from the subsoil deposits within the 28-Bu-62 site area include a possible quartzite point tip from ST 277 (N00755/W00450) and a weathered argillite biface from EU 3, possibly a scraper or knife. The remaining possible tools consist of two quartz core fragments from ST254 (N00725/W00400) and EU 1. One may be bifacially flaked.

The majority of the assemblage indicates tool maintenance rather than a production site. The absence of faunal and floral material is probably due to poor preservation; local resource utilization cannot be addressed. The apparent lack of pottery and the projectile point types suggests an Archaic Period site. Given the site location and what is known about other sites in the vicinity, a temporary camp site for utilization of Masons Creek and its associated wetlands is likely. It is not possible to tightly date the site or to discuss its function other than in these broad terms given the absence of features such as hearths, artifact caches, or mortuary pits; the lack of faunal specimens; and the very small areal coverage that does not allow for analysis of spatial distribution of artifacts.

The site investigated through the testing program described above lacks sufficient integrity and richness of resources to render it eligible for the National Register under Evaluation Criterion "d" (the potential to yield important information). The assemblage is similar to many others in the vicinity, there are few diagnostic items, and no features were encountered. However, this survey demonstrates the presence

Table 5.1.
Pre-Contact Artifacts by Project Sub-Area

	Area A	Area B	Area D	Area C (outside site)	Area C 28-Bu-62	Total
Recent fill/ Unassigned	5	1	9	5	1	21
Sod and Plow Zone					89	89
Transitional Layer and Subsoil					43	43
Total	5	1	9	5	133	153

Table 5.2.
Lithics From Tests Within 28-Bu-62

	primary flake	secondary flake	tertiary flake	unident. flake	blocky frag.	point	fcr	other*	unidentifiable (possible raw material)	Total**
Sod and Plow Zone	12	5	39	6	12	3	4	2	5	88 (67%)
Transitional Layer and Subsoil	8	7	20	2	0	1	0	3	2	43 (33%)
Total	20	12	59	8	12	4	4	5	9	131

*Sod and plow zone: 1 core, 1 biface
Transition and subsoil: 2 cores, 1 biface (scraper or knife)
**One item from recent fill is not included; possible pottery sherd is not included.

Table 5.3.
Lithics From Tests Within 28-Bu-62 by Raw Material

	primary flake	secondary flake	tertiary flake	unident. flake	blocky fragment	point	fcr	other	unidentifiable (possible raw material)	Total
argillite	3	6	11	3		3		2	1	29
chert										
grey	2		7		1					10
black	1		7		1					9
brown			2							2
dark green			1							1
red			1							1
variegated	2									3
conglomerate	1						1		1	3
jasper										
brown	1			1						2
red	2		4		1					7
yellow	3	1	5		1					10
variegated			1							1
other				3	1				1	5
quartz	5	4	15	1	7			3		35
quartzite		1	4			1			3	9
sandstone							2		1	3
slate			1							1
Total	**20**	**12**	**59**	**8**	**12**	**4**	**3**	**5**	**14**	**131**

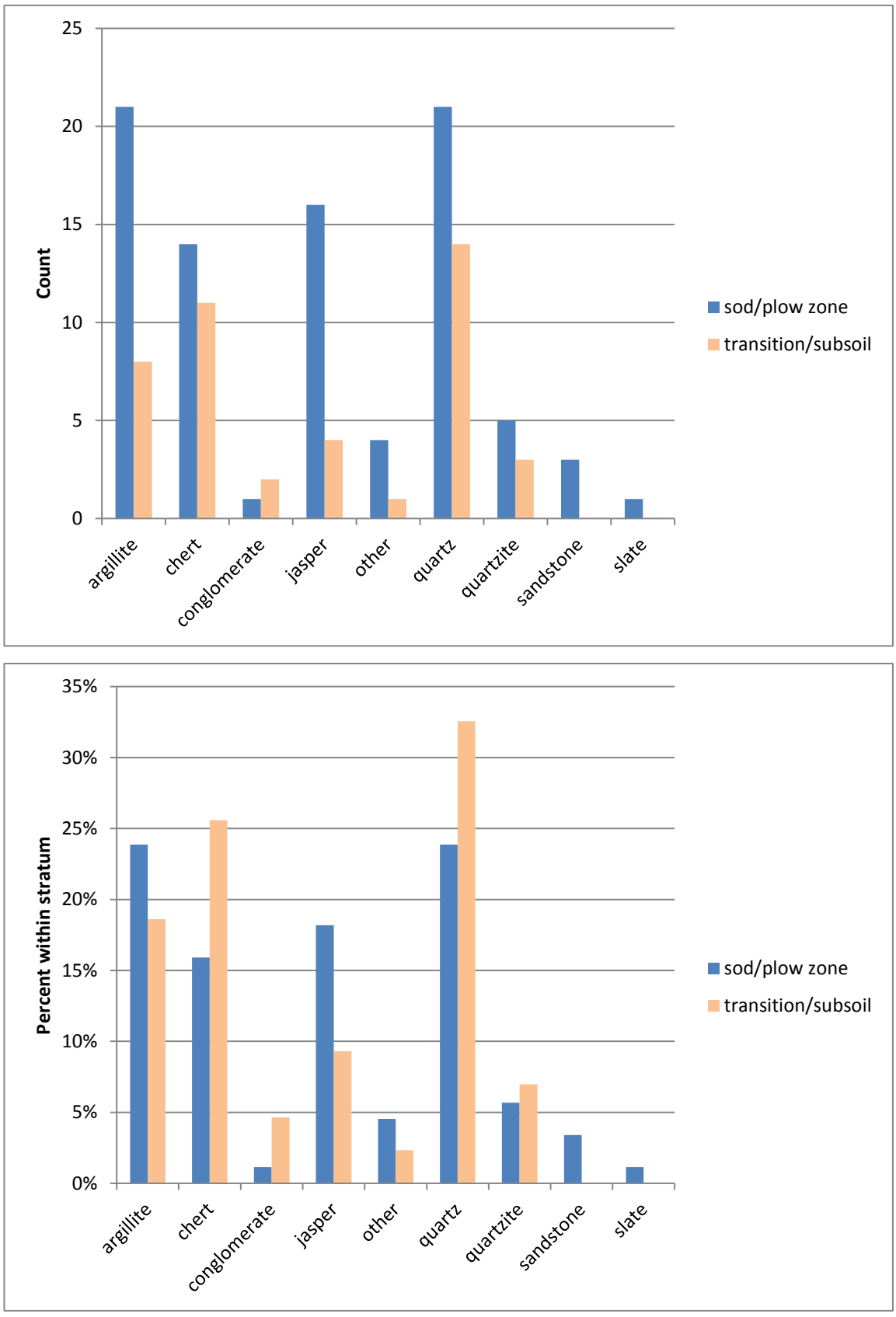


Figure 5.4. Distribution of lithic raw material by stratum – counts (top) and percentages (bottom).

in the area of buried deposits, including below the plow zone. Adjacent sites, including 28-Bu-62 itself, have only been recorded from surface surveys. The research presented in this report also suggests there is a potential for additional artifact deposits, broader site areas allowing for analysis of spatial distribution, features such as fire pits, and possibly other temporal components in the immediate vicinity. In particular, the identified site probably extends north of the fence, and is believed to be a part of the previously recorded site 28-Bu-62, which is poorly known but produced pottery and is thought to be a large multicomponent site. Site 28-Bu-324, also adjacent (possibly to the south?), also produced pottery. The lack of pottery within the site area investigated for the present survey is intriguing, and may suggest a separate spatial component within the complex.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Identification

One Pre-Contact archaeological site has been identified within the project's Area of Potential Effect (APE). The identified site is considered to be a small portion of a previously-recorded site lying to the north of the airport fence, 28-Bu-62, and may also be associated with 28-Bu-324 – both may actually represent one multicomponent site or a larger site complex.

28-Bu-62 was recorded twice, once in 1938 and again in 1984. It lay within the orchard – now woods, with some apple trees still present – along the north side of the present airport. Although it was described originally as occupying only the northwest side of a knoll within the apple orchard north of the airport, the 1984 record places it more generally adjacent to the north of the airport runway, and indicates that information from local collectors suggest it was part of a large multicomponent site. Site 28-Bu-324 has no mapping other than the coordinates of the grid square, which is adjacent to the south of the square where 28-Bu-62 is mapped. There is an artifact collection from site 28-Bu-324 housed at the NJSM indicating a multicomponent Archaic and Woodland occupation.

Rather than register yet another discrete archaeological site in this vicinity, it is appropriate to add the information for the site area identified in the present project to information already recorded for the adjacent site to the north. A New Jersey State Museum Archaeological Site Registration Form has been prepared as an addendum to the registration for 28-Bu-62 (Appendix E).

6.2. Significance

The identified site within the project APE does not appear to independently meet Evaluation Criterion "d" for inclusion in the National Register of Historic Places. No archaeological features such as fire pits were identified, and virtually no faunal material was recovered. Four argillite projectile points or point fragments were found within the site: 2 whole Poplar Island specimens and one broken point tip were from the plow zone and one broken point tip was from the subsoil. These diagnostic items do not add significantly to the present knowledge of lithic technology or materials in the area. The other lithics represent a typical range of raw materials.

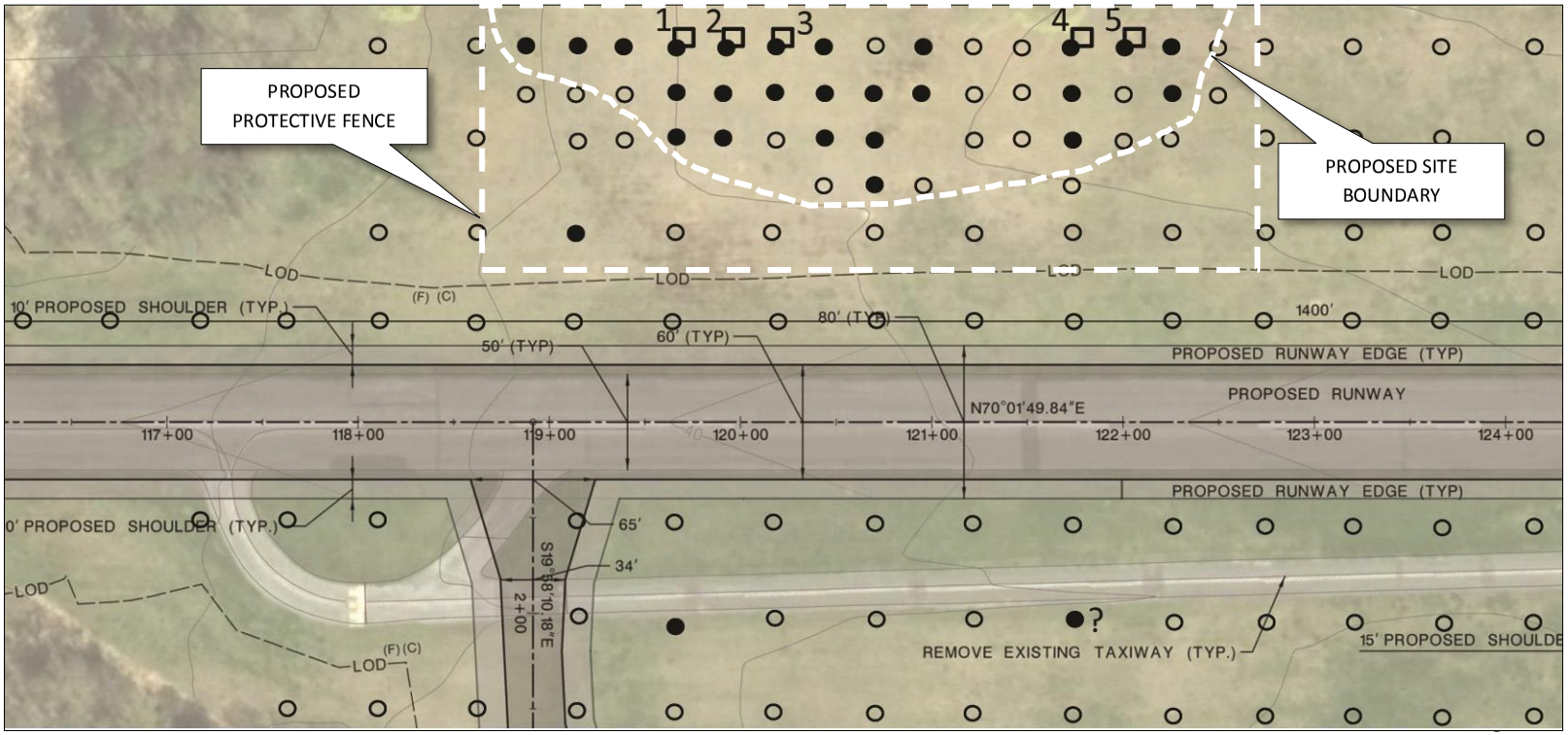
The site identified in the present testing program indicates that buried archaeological resources are probably extant in the parcel immediately adjacent to the north of the airport fence, and suggests more generally that such deposits survive in the area, potentially including elsewhere on airport property (outside the present APE). The larger site or site complex along the east side of Masons Creek, which has not been systematically evaluated, may have the potential to yield information important for understanding Pre-Contact occupation in the Archaic and Woodland Periods, along Masons Creek, the greater Rancocas drainage, and the region – thus, as a whole, meeting National Register eligibility Evaluation Criterion "d". The artifact collection from site 28-Bu-324, now at the New Jersey State Museum (NJSM Site Files), contains 4 plain-stemmed points (probably similar to those found at the airport site – the museum collection was not examined for this study), along with two other point types, a drill, a scraper, a hammerstone, and 8 pottery sherds. The artifacts mentioned from 28-Bu-62 include lithic flakes, fire-cracked rock, and pottery. The archaeological integrity of these previously-identified sites, and numerous others in the immediate area identified through surface observation and local collectors, has not been assessed. The Koens-Crispin Site (28-Bu-5) on the west side of Masons Creek,

which was professionally excavated (albeit in 1916 and 1940) and has a New Jersey Historic Preservation Office Opinion of Eligibility, is the exception.

It is concluded that the archaeological resources identified in this survey need to be preserved and protected in order to prevent further deterioration of the archaeological record in this important Pre-Contact habitation area.

6.3. Assessment of Project Effects

The archaeological site identified in the testing program described here lies outside the direct impact area for the proposed runway improvements project. A plan to avoid and protect the site was adopted by NJDOT and the project engineer following an end-of-field report on Phase IB testing. The plan includes demarcation of the site area on project plans; placement of a permanent survey marker, and on-site fencing to protect the site area (see Appendix A). Figure 6.1 shows the extent of the identified site in relation to the fencing that will be put in place.



KEY (TEST UNITS NOT TO SCALE):

● SHOVEL TEST POSITIVE
FOR PRE-CONTACT ARTIFACTS

○ SHOVEL TEST NEGATIVE
FOR PRE-CONTACT ARTIFACTS

☐ 3' x 3' EXCAVATION UNIT

Figure 6.1. Proposed boundary of identified site (portion of 28-Bu-62) and proposed fencing shown on draft project plan.

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APPENDIX A

Initiation of Consultation Correspondence

HISTORIC PRESERVATION OFC
27 OCT 17
RCVD

State of New Jersey

DEPARTMENT OF TRANSPORTATION
P.O. Box 600
Trenton, New Jersey 08625-0600

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

RICHARD T. HAMMER
Commissioner

15-1796-3 VM
HPO-K2017-090

October 26, 2017

Katherine J. Marcopul, Ph.D.
Administrator and Deputy State Historic Preservation Officer
NJ Department of Environmental Protection
Historic Preservation Office
P.O. Box 404
Trenton, NJ 08625-0404

Attn: Lindsay Thieverage
Vincent Maresca

Re: South Jersey Regional Airport Widening of Runway 8-26
And Ancillary Improvements
Township of Lumberton, Burlington County
Section 106 Consultation

Dear Dr. Marcopul:

The New Jersey Department of Transportation (NJDOT) has initiated environmental studies prior to beginning the design of modifications to the South Jersey Regional Airport in Lumberton Township, Burlington County using funding provided by the Federal Aviation Administration (FAA). It is anticipated that FAA funding will also be used for design and construction of the project. The modifications are required to maintain safe and efficient airport operations, and will address non-standard conditions of the existing runway and taxiway system, bringing Runway 8-26 to standard for current design aircraft, and relocating Taxiway A to meet standards for future design aircraft. An initial assessment of anticipated permits indicated that the following NJDEP permits/approvals will be required:

NJDEP Freshwater Wetlands Individual Permit and Water Quality Certificate
NJDEP Flood Hazard Area Individual Permit
NJDEP construction Activity Stormwater General Permit

The South Jersey Regional Airport encompasses approximately 658 acres, and is publicly owned by the State of New Jersey and administered by the NJDOT's Division of Aeronautics. Existing land use in the vicinity of the airport includes a mix of agricultural and wooded areas, low-density residential developments, and scattered commercial properties. The core of the airport property contains landside and airside facilities; agricultural row-crops; open, maintained fields; freshwater wetlands and open waters. Mason's Creek, a perennial watercourse flows through the core of the airport property from south to north along, and forming a portion of the western property boundary. An unnamed tributary of the south Branch Rancocas Creek flows through an area adjacent to the airport on the eastern side. Three unnamed tributaries of Mason's Creek flow west across the core of the airport property.

According to the 2015 Master Plan Update for the airport, the airport itself is comprised of a single east-west runway (identified as 08/26), 3,881 feet in length; four taxiways (identified as Taxiway A through D); a terminal complex including a main building, multiple hangers (one of which houses the Air Victory Museum), aircraft maintenance building, fuel storage area, and parking for both vehicles and planes; aprons (Main, Transient and East); and three industrial buildings at the east end of the airport. The latter buildings were constructed as wood framed hanger buildings in the 1960s. Hangers A and D in the Terminal area were both built in 1988, while two additional hangers that are no longer extant were built in the mid-1960s. Dates of construction for the four Community Hangers (CH) in the terminal area are somewhat less precise, with construction dates ranging from 1980-93 for CH 2, 1993 for CH 3, and 1996/97 for CH 1; the date of construction for CH4 has not yet been determined.

This letter initiates Section 106 consultation and requests your concurrence with the finding that ***no historic properties*** will be affected pursuant to 36 CFR 800.4(d)(1) by the proposed South Jersey Regional Airport Phase I Airfield Improvements project.

Project Description

The proposed project is comprised of the following components:

1. Widening of Runway 8-26 from 50 feet to 60 feet;
2. Regrade Runway 8-26 and the surrounding Runway Safety Area (RSA);
3. Provide turf shoulders along the runway and turf blast pads at each end;
4. Clear the surrounding Runway Object Free Area (ROFA), including tree removal to the degree practicable;
5. Relocate and widen parallel Taxiway "A" from approximately 20 feet to 25 feet and extend connecting taxiways; and
6. Relocate the segmented circle and wind cone.

Ancillary work will include:

1. Site preparation, grading, drainage and stormwater management facilities;

2. Replacement of the existing culvert crossing of Mason's Creek with a three-sided box culvert, or modification of the existing crossing by adding two 48-inch culverts;
3. Demolition/removal of existing Taxiway "A" pavement;
4. Runway/taxiway lighting and markings; and
5. Trenching for buried utilities.

Alternatives considered included the No-action alternative, building a new airport to FAA standards, relocating operations to an existing nearby airport, and relocation of the existing runway and taxiway. Fourteen scenarios were considered for the relocation of the existing runway and taxiway and were dismissed because of excessive environmental impacts and costs.

800.3 Initiation of Consultation

At the request of the FAA, NJDOT staff initiated technical assistance discussions for the airport project with Vincent Maresca in July of 2017. Using information compiled by AECOM archaeologists the discussions focused on the potential for the proposed work to have an adverse effect on historic properties—notably archeological resources, and an appropriate field testing strategy to investigate that possibility. The net result of those discussions was agreement that in-field testing was required because of existing knowledge about extensive Native American occupation along Mason's Creek, and the inference of minimal ground disturbance from prior runway construction. Mr. Maresca advised that testing in the Eastern portion of the project area (to the east of Station 124+75) was unnecessary because of a significantly lower archeological sensitivity. The Area of Potential Effects (APE) was subsequently revised from that initially proposed by AECOM and includes all areas within which historic properties (should they exist) could be affected by the proposed construction. The APE for archeological resources is restricted to those areas where ground disturbance will occur—or all areas within the Limits of Disturbance and a variable 50 to 150-foot buffer zone to accommodate ancillary construction activities and disturbance. The APE for architectural properties is limited to those properties which may be affected by the proposed construction. Because the majority of the work is extremely low in profile (much at ground level or below) and will not require removal of any structures, only those structure adjacent to the proposed project were assessed.

Consulting parties for the project who would sign a Memorandum of Agreement (should one be required) include the following:

Federal Aviation Administration FAA Harrisburg Airports District Office
NJ Historic Preservation Office/NJ SHPO
NJ Department of Transportation

Federally recognized Tribes who may have an interest in the project should Pre-Contact archeological sites be identified (and who may be signatories to a Memorandum of Agreement should one be required) include:

Absentee Shawnee Tribe of Indians of Oklahoma
Delaware Nation, Oklahoma
Delaware Tribe of Indians
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe

Stockbridge-Munsee Community, Wisconsin

Non-federally recognized tribes who may have an interest in the project should Pre-Contact archeological sites be identified include:

Nanticoke Lenni-Lenape Indian of New Jersey
Powhatan Renape Nation
Ramapough Lunaape Nation
Sand Hill Band of Indians
Sand Hill Indian Historical Association
Cherokee Nation of New Jersey
Cherokee Tribe of New Jersey

Others who may have an interest in the project include:

Air Victory Museum
Civil Air Patrol, Air Victory Museum
Lumberton Township
Lumberton Historical Society
Burlington County Division of Parks Cultural & Heritage Affairs
Burlington County Historical Society

800.4 Identification of Historic Properties

Background research revealed that both historic architectural and archeological properties have been identified in close proximity to the current APE. The Lumberton Rural Agricultural District (SHPO Opinion 9/12/2001) lies to the east of the current APE. The Koens-Crispin Archaeological Site (28Bu2) is located near the western portion of the APE between Mason's Creek and Ark Road. Additional Pre-contact archeological sites have been recorded in the area and are associated with the floodplains of the East and West Branches of Mason's Creek. Pre-Contact artifacts have also reportedly been found in the agricultural fields west of Ark Road.

Minimal reconnaissance level historic architectural survey was undertaken. None of the buildings in the APE serve an agricultural function, thus there is no relationship between those structures and the Lumberton Rural Agricultural District. All of the structures in the APE and on the airport property are utilitarian in nature and related to the airport's function. They range in date of construction from the 1960s to ca. 1996-97, and many exhibit interior and exterior alterations. Only two similarly constructed former hanger structures are located within the APE. Neither of these buildings appears to meet the National Register criteria.

Archeological survey of the APE recovered both pre-Contact and historic period artifacts. A concentration of pre-Contact lithics was identified in an area north of the runway between approximately Stations 118+75 and 122+25. Waste flakes from tool manufacture/maintenance, altered cobbles (some possibly altered during agricultural use of the area), an argillite point tip, and a small amount of faunal remains (primarily shellfish) were recovered from both plowzone and sub-plowzone contexts. Because the site may have integrity and the ability to yield information important in prehistory the site was recommended as being potentially eligible for listing in the National Register of Historic Places. Pre-

Contact archeological materials were also found in several shovel tests across the site. Negative radial testing indicated the artifacts were recovered from disturbed contexts or considered isolated finds.

The light scatter of historic material was recovered from a plowzone context throughout the APE. These materials were generally small and fragmented in nature—undoubtedly due to the agricultural use of the property. The assemblage was comprised primarily of household ceramics and construction materials, but also included smaller amounts of personal items, glass bottles, commercial containers, and "clay pigeon" fragments; and faunal remains. The artifacts, dating from the second quarter of the 19th century through the early 20th century, are not from primary deposit, have little research value, and are not considered potentially eligible for listing in the National Register of Historic Places

800.5 Assessment of Adverse Effects

The pre-Contact archeological site identified during testing for the current project lies wholly outside of the limits of disturbance as currently defined on preliminary plan sheets. Although the formal design phase has not yet been initiated, NJDOT's consultant, AECOM, has advised that the site can be avoided and protected by substantial fencing during construction. AECOM has also suggested (and NJDOT has agreed) that a permanent survey marker be installed so that the site can easily be relocated with precision. In addition, the limits of the site as defined by NV5 will be included on plans for the current project and documented on "As-Built" plans once the project is finished to ensure that future South Jersey airport projects avoid impacting it to the degree possible.

Based on the information presented in the enclosed management summary and described in this letter, the NJDOT requests on behalf of the FAA your concurrence with the finding that pursuant to 36 CFR 800.4(d)(1), ***no historic properties*** will be affected by the proposed South Jersey Regional Airport Phase I Airfield Improvements project with the understanding that:

1. All proposed work, including construction access, staging areas and project construction will be specifically precluded from using any part of the identified site via substantial fencing;
2. Project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction;
3. A permanent survey marker will be installed to assist with the accurate relocation of the site in the future;
4. The pre-Contact site identified during the current survey work will be registered with the New Jersey State Museum; and
5. Additional archeological testing will be undertaken to provide information about the pre-Contact site's integrity and assess its eligibility for listing in the National Register of Historic Places. The testing will be limited to the excavation of four 3 x 3' units within the site's core area. A single archeological report meeting the NJ SHPO standards that describes the field testing and results for both the initial and subsequent Phase II testing will be prepared and submitted in draft to the NJ SHPO by February 28, 2018.

As the NJDOT's consultant is scheduled to complete the draft of the Environmental Assessment (EA) for this project in the first week of November, we would appreciate receiving your concurrence with the

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finding that ***no historic properties*** will be affected by the proposed project so that it can be incorporated into the draft EA as soon as possible. To facilitate your review a concurrence line has been included at the conclusion of this letter. Should you require any additional information during the course of your review, please do not hesitate to me.

Very truly yours,

Lauralee Rappleye
Project Manager/Archeologist
Bureau of Environmental Program Resources

Enclosure: *South Jersey Regional Airport Cultural Resources Survey, Phase I End of Field Memorandum and Management Summary, October 9, 2017*
Proposed Improvements Graphic

C:	E. Gabsewics, FAA Harrisburg Airports	via email, w/enclosures
	Air Victory Museum	w/o enclosures
	Civil Air Patrol, Air Victory Museum	"
	Lumberton Township	"
	Lumberton Historical Society	via email, w/o enclosures
	Burlington County Div. of Parks Cultural & Heritage Affairs	w/o enclosures
	Burlington County Historical Society	"
	A. Velasquez, AECOM	via email, w/ enclosures
	G. Leipfinger, NJDOT, Aeronautics	"
	A. Patel, NJDOT, Aeronautics	"

✓

I concur, ***no historic properties*** will be affected pursuant to 36 CFR 800.4(d)(1) by the proposed South Jersey Regional Airport Phase I Airfield Improvements project with the understanding that:

1. All proposed work, including construction access, staging areas and project construction will be specifically precluded from using any part of the identified site via substantial fencing;
2. Project plans and specifications will clearly identify site boundaries and the location of protective fencing, and will include appropriate notes precluding entry into the site area during construction;
3. A permanent survey marker will be installed to assist with the accurate relocation of the site in the future; and

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4. The pre-Contact site identified during the current survey work will be registered with the New Jersey State Museum; and
5. Additional archeological testing will be undertaken to provide additional information about the pre-Contact site's integrity and assess its eligibility for listing in the National Register of Historic Places. The testing will be limited to the excavation of four 3 x 3' units within the site's core area. A single archeological report meeting the NJ SHPO standards that describes the field testing and results for both the initial and subsequent Phase II testing will be prepared and submitted in draft to the NJ SHPO by February 28, 2018.

No further work is required to comply with Section 106 of the National Historic Preservation Act, as amended. Should the footprint of the project change or unanticipated discoveries are made during construction; pursuant to 36 CFR 800.4 and/or 800.13 re-evaluation of the findings and continuing Section 106 consultation may be required.

_____ I do not concur for the following reason(s):

Katherine J. Marcopul

Katherine J. Marcopul, Ph.D.
Deputy State Historic Preservation Officer

11/13/2017
Date

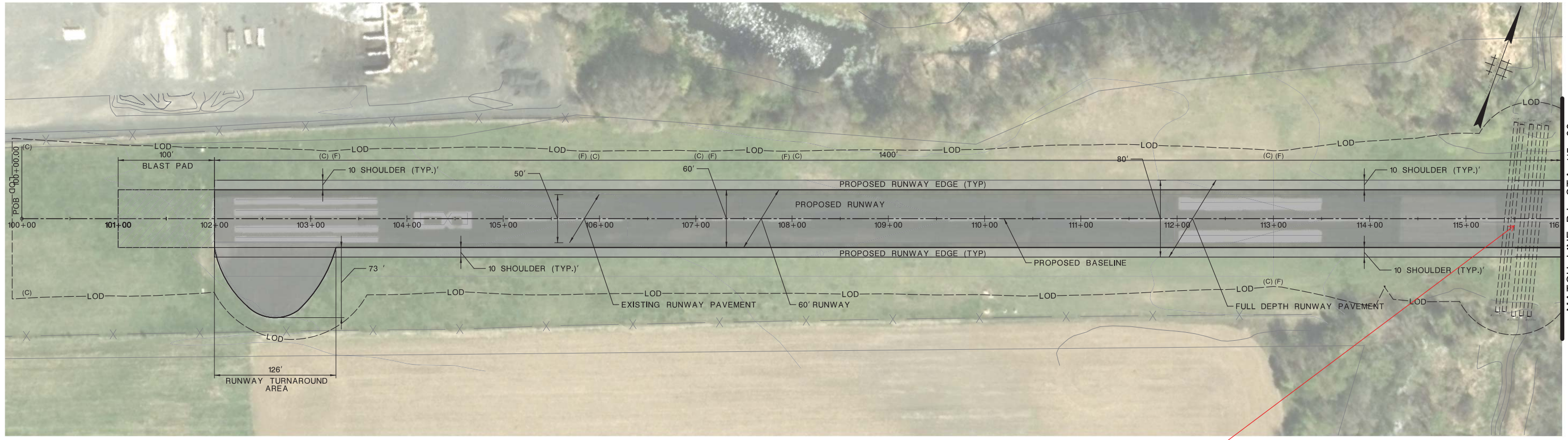
APPENDIX B

Project Draft Plan Sheets

TOWNSHIP OF LUMBERTON

COUNTY OF BURLINGTON

STATE	FEDERAL PROJECT NO.
N.J.	



THE DRAINAGE PLANS CALL FOR TWO ADDITIONAL 48" CMP CULVERTS HERE.
AN ALTERNATIVE UNDER CONSIDERATION IS TO CONSTRUCT A NEW THREE-SIDED CULVERT, THE WIDTH WOULD BE DEPENDENT ON THE STRUCTURAL CHARACTERISTICS, ASSUMING FOR NOW 20' - 24' WIDE.

CULVERT	ELEVATION	
	EXISTING	PROPOSED
TOP OF PIPE. 48" CMP #1. INFLOW	*EL = 33.51*	EL = 36.50
TOP OF PIPE. 48" CMP #2. INFLOW	*EL = 33.84*	EL = 36.50
TOP OF PIPE. 48" CMP #3. INFLOW	*EL = 34.38*	EL = 36.50
TOP OF PIPE. 48" CMP #4. INFLOW	*EL = 34.14*	EL = 36.50
TOP OF PIPE. 48" CMP #5. INFLOW	*EL = 34.22*	EL = 36.50
TOP OF PIPE. 48" CMP #1.	*EL = 34.05*	EL = 35.50
TOP OF PIPE. 48" CMP #2.	*EL = 33.89*	EL = 35.50
TOP OF PIPE. 48" CMP #3.	*EL = 34.01*	EL = 35.50
TOP OF PIPE. 48" CMP #4.	*EL = 33.86*	EL = 35.50
TOP OF PIPE. 48" CMP #5.	*EL = 33.73*	EL = 35.50

DRAFT

NOT TO BE USED FOR CONSTRUCTION

50' 0 50' 100'

C-1 / C-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

SOUTH JERSEY REGIONAL AIRPORT
RUNWAY & TAXIWAY IMPROVEMENTS
CONTRACT NO. 000000000

AECOM TECHNICAL SERVICES, INC.
CERTIFICATE OF AUTHORIZATION NO. 24GA28042700

EDWARD F. SITLER
NEW JERSEY PROFESSIONAL ENGINEER LICENSE NO. 24GE03716000

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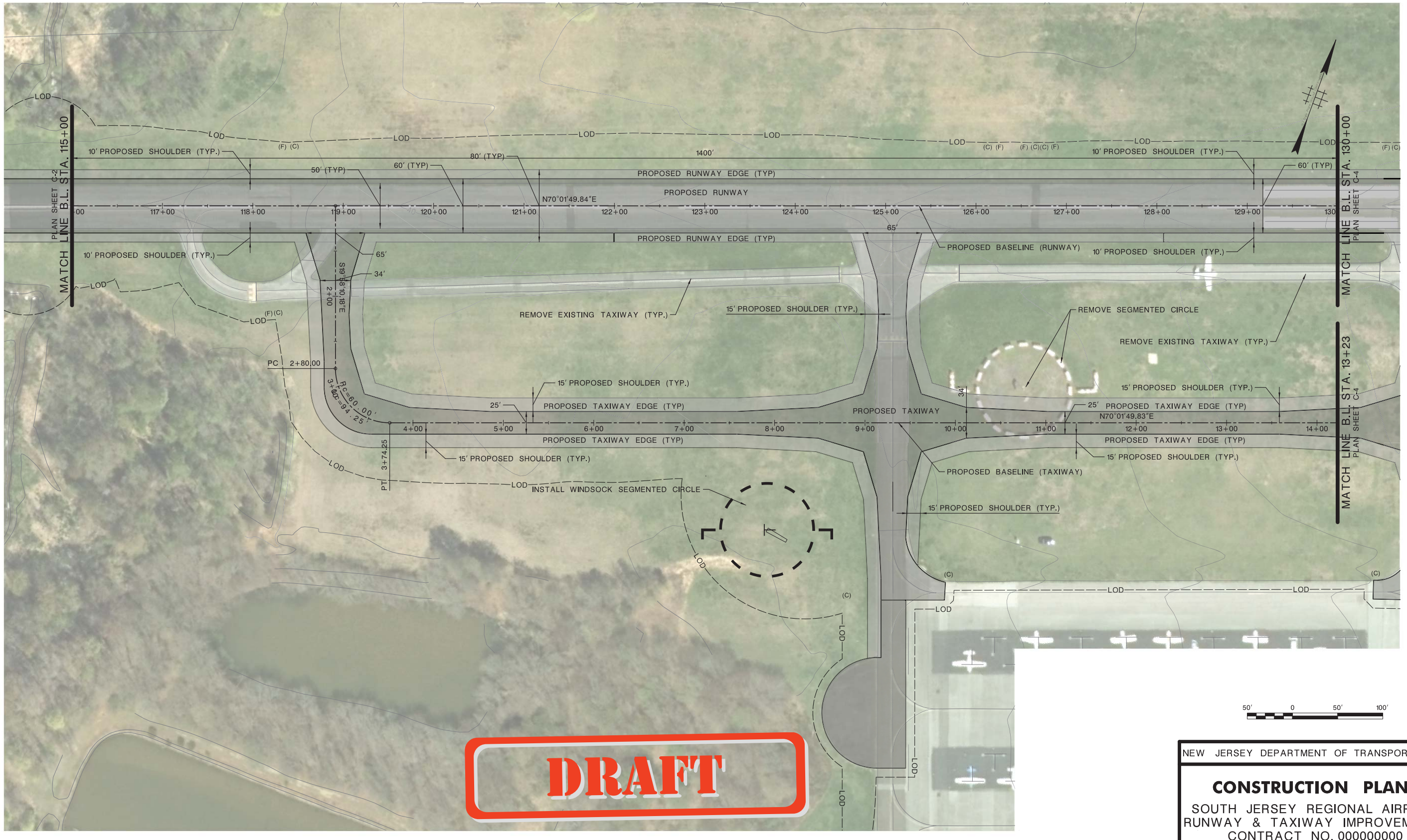
TOWNSHIP OF LUMBERTON

COUNTY OF BURLINGTON

STATE	FEDERAL PROJECT NO.
N.J.	



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50' 0 50' 100'

C-2
C-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

SOUTH JERSEY REGIONAL AIRPORT
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TOWNSHIP OF LUMBERTON

COUNTY OF BURLINGTON

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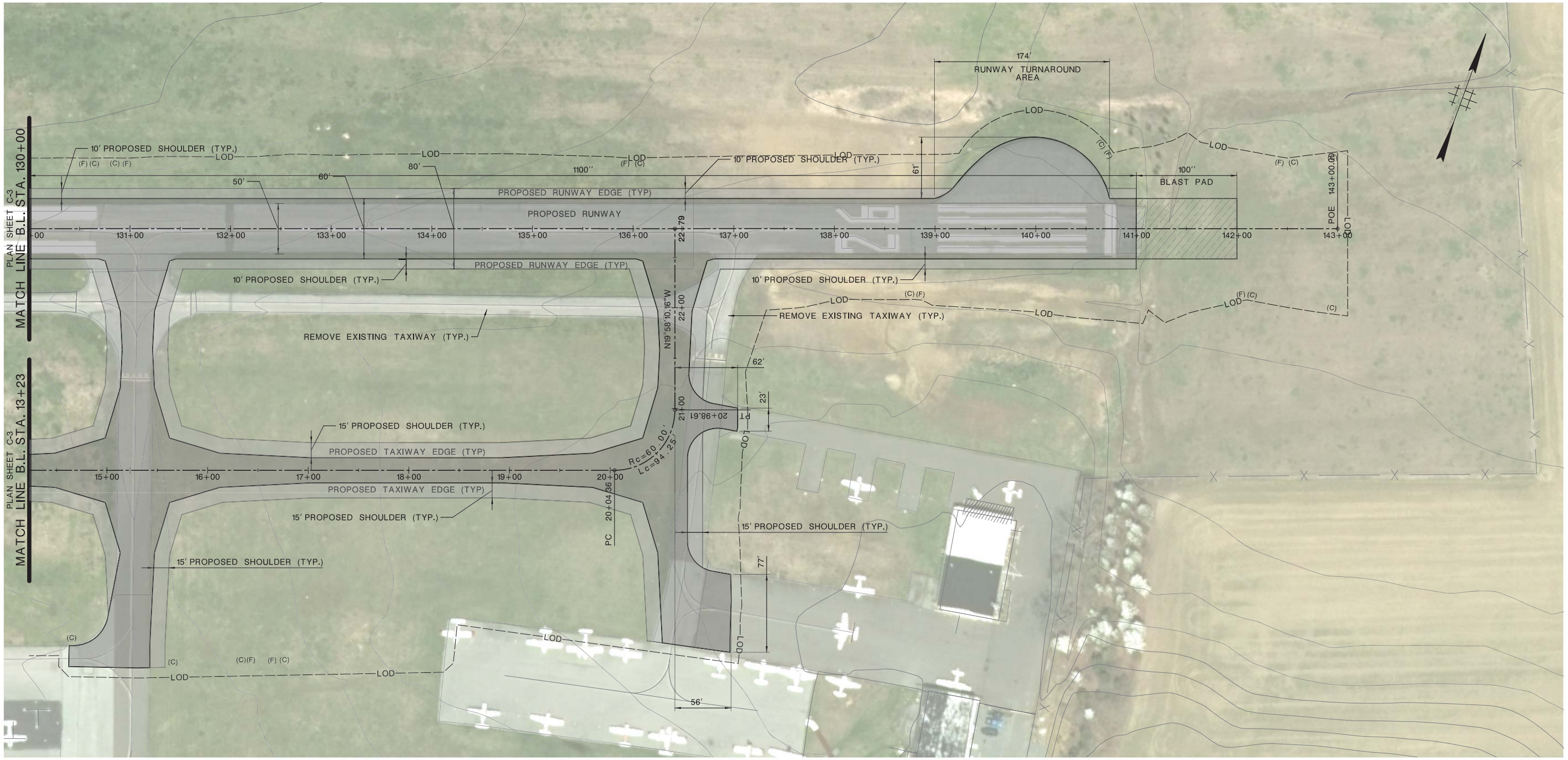

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NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

SOUTH JERSEY REGIONAL AIRPORT
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NOT TO BE USED FOR CONSTRUCTION

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APPENDIX C

Archaeological Provenience Catalog

Appendix C - Archaeological Provenience Catalog - South Jersey Regional Airport

Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0001	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0001 (N00050/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.85'	0.85'	BH	Grassy field. Near parking area. East of electrical line. Sod. Fill.
0002	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0001 (N00050/W00000)	B-01	09/25/2017	dark grayish brown (010YR-4/2) clay loam mottled with dark yellowish brown (010YR-3/6) clay loam	0.85'	1.90'	BH	Gravely. Mottled.
0003	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0001 (N00050/W00000)	C-01	09/25/2017	dark yellowish brown (010YR-3/6) loamy sand	1.90'	2.90'	BH	Compact.
0004	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0002 (N00100/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.30'	BH	Grassy field. Sod. Fill. Brick - DIF.
0005	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0002 (N00100/W00000)	B-01	09/25/2017	dark grayish brown (010YR-4/2) clay loam mottled with dark yellowish brown (010YR-3/6) clay loam	0.30'	0.90'	BH	
0006	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0002 (N00100/W00000)	C-01	09/25/2017	light brownish gray (010YR-6/2) loamy sand mottled with yellowish brown (010YR-5/8) loamy sand	0.90'	1.30'	BH	Possible stream bed?
0007	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0003 (N00100/W00050)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.40'	BH	Sod.
0008	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0003 (N00100/W00050)	B-01	09/25/2017	dark grayish brown (010YR-4/2) silt mottled with dark yellowish brown (010YR-3/6) silt	0.40'	1.60'	BH	Flood plain.
0009	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0003 (N00100/W00050)	C-01	09/25/2017	grayish brown (010YR-5/2) silt mottled with dark yellowish brown (010YR-3/6) silt	1.60'	2.10'	BH	Flood plain.
0010	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0004 (N00100/W00100)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.30'	BH	Sod. Topsoil. Gravely. Brick and coal -- DIF.
0011	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0004 (N00100/W00100)	B-01	09/25/2017	dark grayish brown (010YR-4/2) silt loam mottled with dark yellowish brown (010YR-3/6) silt loam	0.30'	0.80'	BH	Bog iron and gravel. Flood plain.
0012	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0004 (N00100/W00100)	C-01	09/25/2017	grayish brown (010YR-5/2) silty clay mottled with dark yellowish brown (010YR-3/6) silty clay	0.80'	1.60'	BH	Very gravely. Flood plain.

Appendix C - Archaeological Provenience Catalog - South Jersey Regional Airport

Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0013	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0005 (N00100/W00150)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.25'	BH	Sod. Topsoil.
0014	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0005 (N00100/W00150)	B-01	09/25/2017	dark grayish brown (010YR-4/2) clay loam mottled with dark yellowish brown (010YR-3/6) clay loam	0.25'	1.10'	BH	Flood plain. Stopped.
0015	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0006 (N00150/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.80'	CP-I	Asphalt, rocks, some styrofoam, brick, 1 microflake, coal -- collected.
0016	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0006 (N00150/W00000)	B-01	09/25/2017	reddish brown (005YR-5/3) silty clay loam	0.80'	1.00'	CP-I	Only 2 inches into subsoil.
0017	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0007 (N00150/W00050)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.60'	CP-I	Fair amount of rocks and pebbles. Thin layer of topsoil.
0018	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0007 (N00150/W00050)	B-01	09/26/2017	very dark grayish brown (010YR-3/2) clay loam	0.60'	0.70'	CP-I	
0019	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0008 (N00150/W00100)	A-01	09/26/2017	dark brown (010YR-3/3) loam	0.00'	0.40'	BH	Sod. Topsoil.
0020	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0008 (N00150/W00100)	B-01	09/26/2017	very dark grayish brown (010YR-3/2) clay loam mottled with dark yellowish brown (010YR-3/6) clay loam	0.40'	0.90'	BH	Hydric soil with oxidation. Brick -- DIF.
0021	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0008 (N00150/W00100)	C-01	09/26/2017	grayish brown (010YR-5/2) clay mottled with dark yellowish brown (010YR-3/6) clay	0.90'	1.10'	BH	Hydric soil with oxidation.
0022	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0009 (N00200/W00000)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.90'	JRN	Sod and topsoil -- some gravel mostly rounded quartz. 1 coal, 2 brick -- DIF.
0023	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0009 (N00200/W00000)	B-01	09/25/2017	olive brown (2.5Y -4/4) sandy clay loam mottled with yellowish brown (010YR-5/6) sandy clay loam	0.90'	1.15'	JRN	Subsoil -- two pebbles.
0024	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0010 (N00200/W00025)	A-01	09/26/2017	dark brown (010YR-3/3) loam	0.00'	1.00'	BH	Sod. Topsoil. <20 pebbles.
0025	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0010 (N00200/W00025)	B-01	09/26/2017	yellowish brown (010YR-5/6) loamy sand	1.00'	1.20'	BH	Subsoil.

Appendix C - Archaeological Provenience Catalog - South Jersey Regional Airport

Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0026	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0011 (N00200/W00050)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.00'	JRN	Sod and topsoil -- very few pebbles.
0027	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0011 (N00200/W00050)	B-01	09/25/2017	olive brown (2.5Y -4/4) sandy clay loam mottled with yellowish brown (010YR-5/6) sandy clay loam	1.00'	1.40'	JRN	Subsoil -- 1 quartz pebble.
0028	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0012 (N00200/W00075)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand mottled with strong brown (7.5YR-4/6) loamy sand	0.00'	0.70'	JRN	Sod and topsoil. Very few pebbles.
0029	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0012 (N00200/W00075)	B-01	09/26/2017	dark yellowish brown (010YR-4/6) sandy clay loam mottled with strong brown (7.5YR-4/6) sandy clay loam and brown/dark brown (010YR-4/3) sandy clay loam	0.70'	0.75'	JRN	Subsoil -- DNS
0030	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0013 (N00200/W00100)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	Just a few pebbles.
0031	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0013 (N00200/W00100)	B-01	09/25/2017	brown (010YR-5/3) silty clay loam	0.95'	1.10'	CP-I	Compact dry clay.
0032	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0014 (N00200/W00150)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.65'	BH	Sod. Topsoil.
0033	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0014 (N00200/W00150)	B-01	09/25/2017	very dark grayish brown (010YR-3/2) loamy sand mottled with dark yellowish brown (010YR-4/6) loamy sand	0.65'	1.60'	BH	Hydric layer.
0034	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0015 (N00200/W00200)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.40'	JRN	Topsoil and sod. Very few rocks. Brick frag. -- DIF.
0035	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0015 (N00200/W00200)	B-01	09/25/2017	olive brown (2.5Y -4/4) sandy clay loam mottled with yellowish brown (010YR-5/6) sandy clay loam	0.40'	0.80'	JRN	Subsoil -- no rocks.
0036	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0016 (N00200/W00250)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.82'	CP-I	Few pebbles.
0037	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0016 (N00200/W00250)	B-01	09/25/2017	brown (010YR-5/3) silty clay loam	0.82'	1.25'	CP-I	

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0038	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0017 (N00200/W00300)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.50'	LB	Sandy loam with gravel. Fill -- compact. Brick (2) DIF.
0039	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0017 (N00200/W00300)	B-01	09/21/2017	brown/dark brown (010YR-4/3) sandy loam	0.50'	0.90'	LB	Topsoil/plowzone -- compact. Brick (2) DIF.
0040	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0017 (N00200/W00300)	C-01	09/21/2017	yellowish brown (010YR-5/4) loamy sand	0.90'	1.10'	LB	Subsoil -- compact
0041	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0018 (N00200/W00350)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.55'	LB	Sandy loam with gravel. Compact with sod. Brick (1) DIF.
0042	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0018 (N00200/W00350)	B-01	09/21/2017	brown/dark brown (010YR-4/3) sandy loam mottled with yellowish brown (010YR-5/4) sandy loam	0.55'	0.70'	LB	Truncated topsoil -- down to sub. Compact -- few pebbles. 1 coal (DIF)
0043	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0018 (N00200/W00350)	C-01	09/21/2017	yellowish brown (010YR-5/4) sandy loam	0.70'	0.80'	LB	Subsoil
0044	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0019 (N00200/W00400)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.55'	LB	Fill layer. Vertical 1.5' OD PVC pipe in SE corner of test. Dug adjacent to west of pipe.
0045	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0019 (N00200/W00400)	B-01	09/21/2017	brown/dark brown (010YR-4/3) sandy loam	0.55'	1.05'	LB	Topsoil/plowzone
0046	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0019 (N00200/W00400)	C-01	09/21/2017	yellowish brown (010YR-5/4) loamy sand	1.05'	1.10'	LB	Sub -- some gray/green sand nodules.
0047	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0020 (N00200/W00450)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam mottled with yellowish brown (010YR-5/6) sandy loam	0.00'	0.55'	LB	With gravel ironstone. Fill -- same as prior two one line. Not as compact or thick.
0048	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0020 (N00200/W00450)	B-01	09/21/2017	yellowish brown (010YR-5/4) sandy loam mottled with yellowish brown (010YR-5/6) sandy loam	0.55'	1.50'	LB	Mottled topsoil/subsoil
0049	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0020 (N00200/W00450)	C-01	09/21/2017	yellowish brown (010YR-5/6) sand	1.50'	1.70'	LB	
0050	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0021 (N00200/W00500)	A-01	09/21/2017	very dark grayish brown (010YR-3/2) sandy loam mottled with yellowish brown (010YR-5/6) sandy loam	0.00'	1.45'	LB	Same as N200/W550 -- fill. Stratified fill. Partially screened.

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0051	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0021 (N00200/W00500)	B-01	09/21/2017	brown (010YR-5/3) sandy loam	1.45'	1.75'	LB	Truncated topsoil -- compacted
0052	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0021 (N00200/W00500)	C-01	09/21/2017	yellowish brown (010YR-5/6) clay loam	1.75'	1.85'	LB	Subsoil -- compacted
0053	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0022 (N00200/W00550)	A-01	09/21/2017	very dark grayish brown (010YR-3/2) sandy loam	0.00'	1.00'	LB	Fill stratum with ironstone gravel and a few quartz pebbles. Compacted fill with rock, green sand. Lower portion is more mottled. 1 brick frag (DIF)
0054	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0022 (N00200/W00550)	B-01	09/21/2017	brown (010YR-5/3) sandy loam	1.00'	1.75'	LB	Buried topsoil. 1 brick frag (DIF)
0055	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0022 (N00200/W00550)	C-01	09/21/2017	black (010YR-2/1) clay loam	1.75'	2.10'	LB	Organic layer.
0056	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0022 (N00200/W00550)	D-01	09/21/2017	gray (010YR-5/1) clay loam	2.10'	2.20'	LB	Stream bed
0057	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0023 (N00200/W00575)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	1.20'	BH	Sod. Fill.
0058	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0023 (N00200/W00575)	B-01	09/25/2017	dark yellowish brown (010YR-3/4) loamy sand	1.20'	1.55'	BH	Truncated topsoil.
0059	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0023 (N00200/W00575)	C-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.55'	1.65'	BH	Subsoil.
0060	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0024 (N00200/W00600)	A-01	09/21/2017	very dark grayish brown (010YR-3/2) sandy loam	0.00'	0.50'	LB	Sod in fill soil -- compact with scattered ironstone pebbles. Came down on buried plowzone deposit.
0061	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0024 (N00200/W00600)	B-01	09/21/2017	brown (010YR-5/3) sandy loam	0.00'	0.00'	LB	Buried top/plowzone with small amount of ironstone gravel.
0062	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0024 (N00200/W00600)	C-01	09/21/2017	yellowish brown (010YR-5/6) loamy sand	0.50'	1.25'	LB	Subsoil -- compact. 2 brick frag (DIF)

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0063	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0025 (N00225/W00600)	A-01	09/25/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	Sod. Fill.
0064	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0025 (N00225/W00600)	B-01	09/25/2017	very dark grayish brown (010YR-3/2) loam	0.50'	1.05'	BH	Fill/disturbed - with some 10YR2/2 loam mottling
0065	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0025 (N00225/W00600)	C-01	09/25/2017	dark yellowish brown (010YR-3/4) sandy loam	1.05'	1.20'	BH	Topsoil. Truncated almost to subsoil.
0066	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0025 (N00225/W00600)	D-01	09/25/2017	yellowish brown (010YR-5/6) sandy loam	1.20'	1.60'	BH	Subsoil
0067	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0026 (N00250/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.60'	CP-I	Thin layer of topsoil. Piece of metal with bolt/nut -- DIF.
0068	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0026 (N00250/W00000)	B-01	09/25/2017	brown (010YR-5/3) silty clay loam	0.60'	1.00'	CP-I	Very silty clay loam. 1 piece of brick -- DIF. Layer more compact.
0069	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0027 (N00250/W00050)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.78'	CP-I	Fair amount of rocks.
0070	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0027 (N00250/W00050)	B-01	09/26/2017	very dark grayish brown (010YR-3/2) sandy loam	0.78'	0.90'	CP-I	Reached stratum B same as N250 W100. More porominence of iron oxide.
0071	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0028 (N00250/W00100)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.84'	CP-I	Banding of iron oxide. 1 coal frag -- DIF.
0072	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0028 (N00250/W00100)	B-01	09/26/2017	very dark grayish brown (010YR-3/2) sandy loam	0.84'	1.00'	CP-I	Looks the same as in N250 W 150 -- very dark grayish brown with red (rust) spots.
0073	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0029 (N00250/W00150)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.92'	CP-I	Few rocks.
0074	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0029 (N00250/W00150)	B-01	09/26/2017	very dark grayish brown (010YR-3/2) sandy loam	0.92'	1.00'	CP-I	Grayish/reddish compact soil.
0075	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0030 (N00250/W00200)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.85'	CP-I	Very few pebbles -- 2 fragments of rounded pebbles. Semi-compact.

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0076	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0030 (N00250/W00200)	B-01	09/26/2017	yellowish brown (010YR-5/6) sandy loam	0.85'	1.25'	CP-I	Subsoil.
0077	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0031 (N00250/W00250)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.10'	CP-I	Very compact top layer -- caked soil very hard to excavate. Less than 10 rounded/jagged pebbles.
0078	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0031 (N00250/W00250)	B-01	09/26/2017	yellowish brown (010YR-5/6) sandy loam	1.10'	1.35'	CP-I	No pebbles. Easier to excavate soil softer.
0079	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0032 (N00250/W00200)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.80'	CP-I	Less than 10 pebbles. Very loose and dry soil.
0080	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0032 (N00250/W00200)	B-01	09/25/2017	yellowish brown (010YR-5/4) sand	0.80'	1.20'	CP-I	No rocks. Just sand. Nothing found.
0081	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0033 (N00250/W00350)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.90'	CP-I	Very dry soil.
0082	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0033 (N00250/W00350)	B-01	09/26/2017	yellowish brown (010YR-5/4) sand	0.90'	1.39'	CP-I	1 piece of sherd no glaze -- DIF. Very sandy few pebbles.
0083	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0034 (N00250/W00400)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.25'	CP-I	Dry area. Loose soil.
0084	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0034 (N00250/W00400)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.25'	1.73'	CP-I	
0085	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0035 (N00250/W00425)	A-01	09/25/2017	very dark grayish brown (010YR-3/2) loamy sand	0.00'	1.80'	CP-I	Heavy gravel.
0086	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0035 (N00250/W00425)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.80'	1.85'	CP-I	
0087	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0036 (N00250/W00450)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.47'	CP-I	Very thin layer. Nothng but high amount of pebbles.
0088	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0036 (N00250/W00450)	B-01	09/25/2017	dark yellowish brown (010YR-4/6) loamy sand	0.47'	1.60'	CP-I	

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0089	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0036 (N00250/W00450)	C-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.60'	2.10'	CP-I	
0090	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0037 (N00250/W00275)	A-01	09/25/2017	very dark grayish brown (010YR-3/2) loamy sand	0.00'	2.20'	CP-I	Heavy gravel. Clean break into sand layer.
0091	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0038 (N00250/W00500)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.60'	CP-I	Very thin layer.
0092	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0038 (N00250/W00500)	B-01	09/25/2017	dark yellowish brown (010YR-4/6) sandy loam	0.60'	1.23'	CP-I	Truncated topsoil. Lighter than stratum A.
0093	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0038 (N00250/W00500)	C-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.23'	1.76'	CP-I	
0094	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0039 (N00250/W00550)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loam	0.00'	0.50'	BH	Fill. Sod.
0095	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0039 (N00250/W00550)	B-01	09/25/2017	dark yellowish brown (010YR-3/4) loamy sand	0.50'	1.45'	BH	Topsoil. Plowzone.
0096	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0039 (N00250/W00550)	C-01	09/25/2017	dark yellowish brown (010YR-3/4) loamy sand	1.45'	1.70'	BH	Subsoil
0097	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0040 (N00250/W00600)	A-01	09/25/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.45'	BH	Sod. Fill.
0098	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0040 (N00250/W00600)	B-01	09/25/2017	very dark grayish brown (010YR-3/2) silt loam mottled with very dark brown (010YR-2/2) silt loam	0.45'	0.55'	BH	Dark and compact. Can be part of stratum A.
0099	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0040 (N00250/W00600)	C-01	09/25/2017	dark yellowish brown (010YR-3/4) loamy sand	0.55'	1.00'	BH	Truncated topsoil.
0100	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0040 (N00250/W00600)	D-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.00'	1.60'	BH	Subsoil.
0101	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0041 (N00275/W00600)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	There seems to be a buried topsoil. I counted it all as stratum A until I reached the sand.

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0102	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0041 (N00275/W00600)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	0.95'	1.90'	CP-I	
0103	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0042 (N00300/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand mottled with yellowish brown (010YR-5/6) loamy sand	0.00'	0.30'	JRN	Sod and fill. Mottled with gravel (rounded quartz and angular stones). Wire nail shank and brick fragment -- DIF.
0104	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0042 (N00300/W00000)	B-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.95'	JRN	Plowzone -- significantly fewer pebbles.
0105	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0042 (N00300/W00000)	C-01	09/25/2017	yellowish brown (010YR-5/6) sandy clay loam mottled with dark grayish brown (2.5Y -4/2) sandy clay loam	0.95'	1.20'	JRN	Subsoil -- no pebbles.
0106	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0043 (N00300/W00050)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	Sod and topsoil; very few pebbles. 1 brick fragment -- DIF
0107	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0043 (N00300/W00050)	B-01	09/25/2017	yellowish brown (010YR-5/6) sandy clay loam mottled with dark grayish brown (2.5Y -4/2) sandy clay loam	0.80'	1.10'	JRN	Mottled; more clay; very few pebbles.
0108	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0044 (N00300/W00100)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	Sod and topsoil -- very few pebbles.
0109	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0044 (N00300/W00100)	B-01	09/25/2017	olive gray (005Y -5/2) sandy clay loam mottled with yellowish brown (010YR-5/6) sandy clay loam	0.80'	1.60'	JRN	Mottled; becomes less mottled at depth and more sandy. Virtually no stones.
0110	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0045 (N00300/W00150)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.00'	JRN	Sod and topsoil; somewhat compact.
0111	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0045 (N00300/W00150)	B-01	09/21/2017	yellowish brown (010YR-5/4) sandy clay mottled with dark yellowish brown (010YR-4/6) sandy clay	1.00'	1.20'	JRN	Subsoil -- no pebbles.
0112	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0046 (N00300/W00200)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/6) sandy clay loam and light olive brown (2.5Y -5/4) sandy clay loam	0.00'	0.85'	JRN	Sod and fill; compact; mottled. 2 coal, 2 brick, 1 nail or wire fragment -- DIF
0113	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0046 (N00300/W00200)	B-01	09/21/2017	yellowish brown (010YR-5/6) sandy clay mottled with light olive brown (2.5Y -5/4) sandy clay	0.85'	1.15'	JRN	Subsoil -- no rocks.

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0114	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0047 (N00300/W00250)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.30'	JRN	Sod and topsoil -- no rocks.
0115	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0047 (N00300/W00250)	B-01	09/21/2017	yellowish brown (010YR-5/6) sand	1.30'	1.70'	JRN	Subsoil -- 2 very small pebbles.
0116	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0048 (N00300/W00300)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.60'	JRN	Topsoil and sod
0117	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0048 (N00300/W00300)	B-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/6) sandy clay loam	0.60'	0.90'	JRN	Mottled stratum; transition to subsoil.
0118	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0048 (N00300/W00300)	C-01	09/21/2017	yellowish brown (010YR-5/6) sandy clay loam	0.90'	1.40'	JRN	Subsoil -- no rocks
0119	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0049 (N00300/W00350)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand mottled with brown (010YR-5/3) sand	0.00'	0.80'	JRN	Sod and topsoil; fill layer; lighter mottling of subsoil at bottom.
0120	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0049 (N00300/W00350)	B-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.80'	1.50'	JRN	Buried topsoil just below lighter mottling.
0121	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0049 (N00300/W00350)	C-01	09/21/2017	brown (010YR-5/3) sand	1.50'	2.25'	JRN	Subsoil -- like beach sand.
0122	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0050 (N00300/W00400)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.90'	JRN	Sod and topsoil -- some pebbles.
0123	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0050 (N00300/W00400)	B-01	09/21/2017	brown (010YR-5/3) sand	0.90'	2.00'	JRN	Subsoil -- like beach sand.
0124	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0051 (N00300/W00450)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.40'	JRN	Sod and topsoil.
0125	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0051 (N00300/W00450)	B-01	09/21/2017	dark yellowish brown (010YR-4/4) loamy sand	0.40'	1.30'	JRN	Plowzone; very few pebbles.
0126	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0051 (N00300/W00450)	C-01	09/21/2017	light yellowish brown (2.5Y -6/4) sand	1.30'	1.65'	JRN	Subsoil with a few rounded pebbles. Like beach sand.

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0127	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0052 (N00300/W00500)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.25'	JRN	Sod and topsoil.
0128	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0052 (N00300/W00500)	B-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.25'	0.80'	JRN	Fill layer? A lot of gravel -- rounded quartz and bog iron
0129	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0052 (N00300/W00500)	C-01	09/21/2017	dark yellowish brown (010YR-3/4) loamy sand	0.80'	1.10'	JRN	Compact -- very few gravel
0130	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0052 (N00300/W00500)	D-01	09/21/2017	dark yellowish brown (010YR-4/6) sandy clay loam	1.10'	1.45'	JRN	Compact subsoil; a couple of pebbles.
0131	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0053 (N00300/W00500)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	Similar to N300/W600.
0132	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0053 (N00300/W00500)	B-01	09/21/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	1.10'	JRN	Similar to N300/W600.
0133	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0053 (N00300/W00500)	C-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.10'	1.45'	JRN	Subsoil -- no rocks.
0134	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0054 (N00300/W00575)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.20'	CP-I	Grassy area. Perhaps a buried topsoil? After an inch or 2 the color changes slightly but not much. (10YR 4/6).
0135	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0054 (N00300/W00575)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	1.20'	1.54'	CP-I	No pebbles
0136	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0055 (N00300/W00600)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	Sod and topsoil -- a few small pebbles. Not a clear break between strata A and B.
0137	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0055 (N00300/W00600)	B-01	09/21/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	1.00'	JRN	Plowzone -- few pebbles.
0138	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0055 (N00300/W00600)	C-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.00'	1.80'	JRN	Subsoil -- 3 small pebbles.
0139	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0056 (N00325/W00600)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.95'	JRN	Sod and topsoil/plowzone; very few pebbles.

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0140	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0056 (N00325/W00600)	B-01	09/25/2017	yellowish brown (010YR-5/4) sand	0.95'	1.70'	JRN	Subsoil -- no rocks
0141	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0057 (N00350/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.20'	CP-I	Gravel and pebbles. Possible fill layer at the top; not distiguishable from stratum A.
0142	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0057 (N00350/W00000)	B-01	09/25/2017	brown (010YR-5/3) clay loam	1.20'	1.30'	CP-I	Clay layer; 1 pebble
0143	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0058 (N00350/W00050)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand mottled with strong brown (7.5YR-4/6) loamy sand	0.00'	0.85'	JRN	Sod and fill? Very few rocks. Sheet of plasic -- DIF
0144	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0058 (N00350/W00050)	B-01	09/26/2017	dark yellowish brown (010YR-4/6) sandy clay loam mottled with strong brown (7.5YR-4/6) sandy clay loam and dark yellowish brown (010YR-4/4) sandy clay loam and yellowish brown (010YR-5/4) sandy clay loam	0.85'	0.90'	JRN	Subsoil -- DNS
0145	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0059 (N00350/W00100)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand mottled with strong brown (7.5YR-4/6) loamy sand	0.00'	0.85'	JRN	Sod and fill? Very few angular pebbles. Compact.
0146	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0059 (N00350/W00100)	B-01	09/26/2017	dark yellowish brown (010YR-4/6) sandy clay loam mottled with strong brown (7.5YR-4/6) sandy clay loam and dark yellowish brown (010YR-4/4) sandy clay loam and yellowish brown (010YR-5/4) sandy clay loam	0.85'	0.90'	JRN	Subsoil -- DNS
0147	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0060 (N00350/W00150)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	Sod and topsoil -- compact with very few pebbles. Some slight mottling.
0148	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0060 (N00350/W00150)	B-01	09/26/2017	dark yellowish brown (010YR-4/6) sandy clay loam mottled with strong brown (7.5YR-4/6) sandy clay loam and dark yellowish brown (010YR-4/4) sandy clay loam and yellowish brown (010YR-5/4) sandy clay loam	0.80'	1.05'	JRN	Subsoil -- no stones

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0149	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0061 (N00350/W00200)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.85'	JRN	Sod and topsoil/plowzone. Very few pebbles.
0150	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0061 (N00350/W00200)	B-01	09/26/2017	dark yellowish brown (010YR-4/6) sandy clay loam mottled with strong brown (7.5YR-4/6) sandy clay loam and dark yellowish brown (010YR-4/4) sandy clay loam and yellowish brown (010YR-5/4) sandy clay loam	0.85'	1.15'	JRN	Subsoil -- 2 pebbles
0151	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0062 (N00350/W00250)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.20'	JRN	Sod and topsoil/plowzone. Very few pebbles. Some bioturbation 0.4' down causing slight mottling with subsoil.
0152	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0062 (N00350/W00250)	B-01	09/26/2017	yellowish brown (010YR-5/6) loamy sand	1.20'	1.60'	JRN	Subsoil -- no rocks
0153	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0063 (N00350/W00300)	A-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.30'	JRN	Sod and topsoil -- very few pebbles.
0154	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0063 (N00350/W00300)	B-01	09/26/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/6) loamy sand	0.30'	0.80'	JRN	Plowzone -- mottled. Bioturbated. Very few pebbles.
0155	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0063 (N00350/W00300)	C-01	09/26/2017	yellowish brown (010YR-5/6) sandy loam	0.80'	1.20'	JRN	Subsoil -- no rocks
0156	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0064 (N00350/W00350)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.60'	JRN	Sod and topsoil/plowzone. Very few pebbles.
0157	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0064 (N00350/W00350)	B-01	09/25/2017	light yellowish brown (010YR-6/4) sand	1.60'	2.10'	JRN	Subsoil -- no stones. Like beach sand.
0158	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0065 (N00350/W00400)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.00'	JRN	Sod and topsoil/plowzone. Dry and friable. Concentration of stone and mortar in SW corner -- on top of subsoil.
0159	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0065 (N00350/W00400)	B-01	09/25/2017	light yellowish brown (010YR-6/4) sand	1.00'	2.10'	JRN	Subsoil -- no stones. Like beach sand.

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0160	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0066 (N00350/W00450)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	Sod and topsoil -- a little bit of mottling with subsoil at bottom. Possibly cut and filled topsoil layer.
0161	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0066 (N00350/W00450)	B-01	09/25/2017	yellowish brown (010YR-5/4) sand	0.80'	1.50'	JRN	Subsoil -- no stones
0162	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0067 (N00350/W00500)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.20'	JRN	Sod and topsoil/plowzone -- very few stones
0163	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0067 (N00350/W00500)	B-01	09/25/2017	yellowish brown (010YR-5/4) sandy clay loam	1.20'	1.60'	JRN	Moist subsoil -- no rocks.
0164	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0068 (N00350/W00550)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.10'	JRN	Sod and topsoil/plowzone -- similar to N350/W600.
0165	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0068 (N00350/W00550)	B-01	09/25/2017	yellowish brown (010YR-5/4) sand	1.10'	1.50'	JRN	Subsoil -- no stones. Similar to N350/W600.
0166	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0069 (N00350/W00600)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.85'	JRN	Topsoil/plowzone and sod -- very few pebbles.
0167	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0069 (N00350/W00600)	B-01	09/25/2017	yellowish brown (010YR-5/4) sand	0.85'	1.35'	JRN	Subsoil -- no stones
0168	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0070 (N00400/W00000)	A-01	09/25/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.52'	CP-I	Top layer full of gravel and asphalt. There might have been a possible fill layer but it was indistinguishable from stratum A so I called everything from 0 - 1.52' stratum A.
0169	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0070 (N00400/W00000)	B-01	09/25/2017	brown (010YR-5/3) clay loam	1.52'	1.75'	CP-I	More plasticity.
0170	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0071 (N00400/W00050)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.02'	CP-I	Topsoil returned to being loose and sand. Paint chips, an unidentifiable piece of metal, 2 pieces of coal -- DIF.
0171	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0071 (N00400/W00050)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.02'	1.30'	CP-I	Although not reached stratum B looked like the stratum we've been getting in previous units.

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0172	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0072 (N00400/W00100)	A-01	09/21/2017	dark yellowish brown (010YR-3/4) loam	0.00'	1.10'	CP-I	A more compact loam from last STP.
0173	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0072 (N00400/W00100)	B-01	09/21/2017	dark grayish brown (010YR-4/2) clay loam	1.10'	1.20'	CP-I	An inch into stratum B -- grayish compact clay loam.
0174	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0073 (N00400/W00150)	A-01	09/21/2017	dark yellowish brown (010YR-3/4) loam	0.00'	1.15'	CP-I	1 piece of coal -- DIF
0175	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0073 (N00400/W00150)	B-01	09/21/2017	yellowish brown (010YR-5/6) clay loam	1.15'	1.35'	CP-I	Compact. This is different from what I have been getting so far in other units on N400. From N400/W200 to N400/W550 subsoil was mainly sand. This time it's darker compact material of a silty texture with a small amount of plasticity making it a bit cl
0176	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0074 (N00400/W00200)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	A couple of pebbles.
0177	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0074 (N00400/W00200)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.00'	1.35'	CP-I	
0178	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0075 (N00400/W00250)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.24'	CP-I	Thick layer of topsoil; very few pebbles.
0179	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0075 (N00400/W00250)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.24'	1.60'	CP-I	
0180	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0076 (N00400/W00300)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.90'	CP-I	
0181	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0076 (N00400/W00300)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	0.90'	1.25'	CP-I	1 pebble
0182	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0077 (N00400/W00350)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.15'	CP-I	
0183	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0077 (N00400/W00350)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.15'	1.62'	CP-I	

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0184	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0078 (N00400/W00400)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.30'	CP-I	3 pebbles
0185	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0078 (N00400/W00400)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.30'	1.78'	CP-I	1 pebble
0186	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0079 (N00400/W00450)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.71'	CP-I	Very few pebbles.
0187	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0079 (N00400/W00450)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	0.71'	1.20'	CP-I	
0188	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0080 (N00400/W00500)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	Topsoil -- few rocks.
0189	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0080 (N00400/W00500)	B-01	09/21/2017	brown (010YR-5/3) sand	1.00'	1.40'	CP-I	Sandy material. 1 piece of redware -- may be intrusive from top stratum.
0190	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0081 (N00400/W00550)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.21'	CP-I	1 pebble
0191	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0081 (N00400/W00550)	B-01	09/21/2017	brown (010YR-5/3) sand	1.21'	1.55'	JRN	Sharp break
0192	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0082 (N00400/W00600)	A-01	09/21/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.10'	JRN	Sod and topsoil -- very few small pebbles
0193	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0082 (N00400/W00600)	B-01	09/21/2017	yellowish brown (010YR-5/4) sand	1.10'	1.60'	JRN	Subsoil -- no rocks.
0194	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0083 (N00400/W00650)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.90'	LB	Sod in topsoil. A few rocks -- ironstone
0195	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0083 (N00400/W00650)	B-01	09/21/2017	yellowish brown (010YR-5/6) sandy loam	0.90'	1.30'	LB	Subsoil
0196	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0084 (N00400/W00700)	A-01	09/21/2017	dark brown (010YR-3/3) sandy loam mottled with yellowish brown (010YR-5/4) sandy loam and dark yellowish brown (010YR-4/6) sandy loam	0.00'	0.80'	LB	Fill -- mottled bottom zone 0.3' above topsoil. Not separated. Olive green bottle glass (body), clay pidgeon -- DIF

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0197	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0084 (N00400/W00700)	B-01	09/21/2017	yellowish brown (010YR-5/4) sandy loam	0.80'	1.50'	LB	Buried plowzone/topsoil. 1 coal ash -- DIF
0198	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0084 (N00400/W00700)	C-01	09/21/2017	yellowish brown (010YR-5/6) sandy clay loam	1.50'	1.70'	LB	
0199	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0085 (N00445/W00400)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.95'	BH	Sod. Topsoil.
0200	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0085 (N00445/W00400)	B-01	09/25/2017	pale brown (010YR-6/3) sand	0.95'	1.10'	BH	Subsoil.
0201	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0086 (N00445/W00450)	A-01	09/25/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.75'	BH	Sod. Topsoil.
0202	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0086 (N00445/W00450)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	0.75'	1.80'	BH	Subsoil.
0203	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0087 (N00445/W00500)	A-01	09/25/2017	yellowish brown (010YR-5/4) loamy sand	0.00'	0.80'	BH	Sod. Topsoil.
0204	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0087 (N00445/W00500)	B-01	09/25/2017	yellowish brown (010YR-5/6) sand	0.80'	1.50'	BH	Subsoil.
0205	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0088 (N00445/W00550)	A-01	09/25/2017	yellowish brown (010YR-5/4) loam	0.00'	1.20'	BH	Sod. Topsoil. Coal -- DIF
0206	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0088 (N00445/W00550)	B-01	09/25/2017	yellowish brown (010YR-5/6) loamy sand	1.20'	1.80'	BH	Subsoil. 5 brick -- DIF
0207	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0089 (N00450/W00000)	A-01	09/26/2017	dark brown (010YR-3/3) loam	0.00'	1.25'	BH	Sod. Disturbed topsoil. Gravel.
0208	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0089 (N00450/W00000)	B-01	09/26/2017	yellowish brown (010YR-5/6) loamy sand	1.25'	1.40'	BH	Subsoil.
0209	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0090 (N00450/W00050)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.20'	BH	Sod. Topsoil.

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0210	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0090 (N00450/W00050)	B-01	09/26/2017	yellowish brown (010YR-5/6) loamy sand	1.20'	1.30'	BH	Subsoil.
0211	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0091 (N00448/W00100)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.50'	BH	Sod. Topsoil. Fairly compact. Few rounded pebbles.
0212	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0091 (N00448/W00100)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	1.50'	1.60'	BH	Subsoil.
0213	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0092 (N00448/W00150)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.60'	BH	Sod. Topsoil.
0214	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0092 (N00448/W00150)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	1.60'	1.80'	BH	Subsoil. Clay inclusions.
0215	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0093 (N00450/W00200)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.30'	BH	Sod. Topsoil.
0216	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0093 (N00450/W00200)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	1.30'	1.90'	BH	Subsoil. Very few pebbles.
0217	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0094 (N00450/W00250)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.10'	BH	Sod. Topsoil. Rounded pebbles. Coal -- DIF
0218	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0094 (N00450/W00250)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	1.10'	1.50'	BH	Subsoil. <10 rounded pebbles. Ironstone
0219	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0095 (N00450/W00300)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.10'	BH	Sod. Topsoil.
0220	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0095 (N00450/W00300)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	1.10'	1.50'	BH	Subsoil.
0221	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0096 (N00450/W00350)	A-01	09/26/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	BH	Sod. Topsoil.
0222	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0096 (N00450/W00350)	B-01	09/26/2017	yellowish brown (010YR-5/6) sand	0.75'	1.10'	BH	Subsoil.

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0223	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0097 (N00450/W01700)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.00'	JRN	Sod and topsoil. Noticibly less compact than N450/W1800. Some pebbles. 1 piece of coal -- DIF
0224	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0097 (N00450/W01700)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	1.00'	1.05'	JRN	Subsoil -- DNS
0225	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0098 (N00450/W01750)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.84'	CP-I	Few pebbles
0226	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0099 (N00450/W01800)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.70'	JRN	Sod and topsoil; very few pebbles; compact. 1 brick, 3 coal -- DIF
0227	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0099 (N00450/W01800)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.70'	0.75'	JRN	Subsoil -- DNS
0228	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0100 (N00450/W01850)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.85'	CP-I	Very few pebbles.
0229	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0101 (N00450/W01900)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.75'	JRN	1 piece of coal - DIF
0230	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0101 (N00450/W01900)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.75'	0.80'	JRN	did not screen
0231	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0102 (N00450/W01925)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.81'	CP-I	1 piece of colorless bottle glass - DIF
0232	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0103 (N00450/W01975)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.90'	CP-I	a fair amount of pebbles
0233	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0104 (N00450/W01950)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.70'	JRN	projectile from bottom of deposit - sharp break between A & B
0234	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0104 (N00450/W01950)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.70'	1.10'	JRN	subsoil - small amount of pebbles
0235	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0105 (N00450/W02000)	A-01	09/14/2017	very dark grayish brown (010YR-3/2) sandy loam	0.00'	1.10'	CP-I	few pebbles

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0236	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0106 (N00450/W02050)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.85'	JRN	sandier deposit - less clay than N450W2250 - coal - DIF
0237	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0106 (N00450/W02050)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.85'	0.90'	JRN	did not screen
0238	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0107 (N00450/W02100)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.10'	CP-I	a few pebbles
0239	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0108 (N00450/W02150)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.00'	CP-I	a few ironstone, quartz pebbles
0240	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0108 (N00450/W02150)	B-01	09/14/2017	yellowish brown (010YR-5/6) silt loam	1.00'	1.20'	CP-I	
0241	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0109 (N00450/W02250)	A-01	09/14/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	1.00'	JRN	a few pebbles - asphalt [dif] glass, brick
0242	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0109 (N00450/W02250)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	1.00'	1.05'	JRN	
0243	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0110 (N00450/W02300)	A-01	09/14/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.95'	JRN	asphalt [dif]
0244	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0110 (N00450/W02300)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.95'	1.00'	JRN	subsoil
0245	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0111 (N00450/W02350)	A-01	09/14/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.94'	CP-I	a few pebbles - thick layer - single pieces of coal and brick [dif]
0246	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0112 (N00450/W02400)	A-01	09/14/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.95'	JRN	coal ash [dif] - a couple of stones
0247	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0112 (N00450/W02400)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.95'	1.00'	JRN	subsoil
0248	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0113 (N00445/W01350)	A-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.00'	0.30'	JRN	compact with gravel

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0249	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0114 (N00455/W01400)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	heavy gravel starting at 0.2 foot - cut and filled?
0250	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0115 (N00455/W01500)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.53'	CP-I	thins topsoil - few pebbles
0251	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0115 (N00455/W01500)	B-01	09/14/2017	yellowish brown (010YR-5/6) silt loam	0.53'	0.69'	CP-I	subsoil
0252	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0116 (N00445/W01550)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	coal - dif
0253	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0116 (N00445/W01550)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.50'	0.70'	BH	very few pebbles
0254	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0117 (N00455/W01600)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.45'	JRN	few pebbles
0255	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0117 (N00455/W01600)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.45'	0.50'	JRN	
0256	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0118 (N00455/W01650)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.52'	CP-I	very shallow topsoil - area has been cut
0257	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0119 (N00475/W01950)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.70'	JRN	brick and coal fragments - dif - very few pebbles
0258	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0119 (N00475/W01950)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.70'	0.90'	JRN	very few pebbles
0259	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0120 (N00500/W00050)	A-01	09/20/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.95'	CP-I	relaively deep deposit - may be fill
0260	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0120 (N00500/W00050)	B-01	09/20/2017	brown (010YR-5/3) sand	1.95'	2.10'	JRN	one brick fragment - dif
0261	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0121 (N00500/W00100)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.60'	BH	1 brick frag. - dif

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0262	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0121 (N00500/W00100)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	1.60'	1.70'	BH	subsoil
0263	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0122 (N00500/W00150)	A-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.25'	JRN	compact root mat - relatively heavy brick deposit - some gravel - sample of brick retained
0264	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0122 (N00500/W00150)	B-01	09/20/2017	light olive brown (2.5Y -5/4) sandy clay loam	1.25'	1.80'	JRN	2 pieces of brick - probably from stratum A - dif
0265	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0123 (N00500/W00200)	A-01	09/20/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.45'	CP-I	redware, shell, brick - brick dif - a few rounded pebbles
0266	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0124 (N00500/W00250)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.20'	BH	historic ceramic
0267	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0124 (N00500/W00250)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	1.20'	1.35'	BH	coal - dif
0268	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0125 (N00500/W00300)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.80'	CP-I	coal, nail
0269	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0125 (N00500/W00300)	B-01	09/20/2017	brown (010YR-5/3) sand	0.80'	1.35'	CP-I	no pebbles or material
0270	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0126 (N00500/W00350)	A-01	09/20/2017	dark yellowish brown (010YR-4/4) loamy sand	0.00'	0.40'	JRN	1 quartz pebble
0271	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0126 (N00500/W00350)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.40'	1.00'	JRN	1 piece of coal and brick - dif - no rocks or pebbles
0272	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0127 (N00500/W00400)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.62'	BH	thins topsoil
0273	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0127 (N00500/W00400)	B-01	09/20/2017	light yellowish brown (010YR-6/4) sand	0.62'	1.30'	BH	subsoil
0274	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0128 (N00500/W00450)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.55'	JRN	

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0275	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0128 (N00500/W00450)	B-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.55'	0.60'	JRN	subsoil
0276	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0129 (N00500/W00500)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.40'	CP-I	
0277	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0129 (N00500/W00500)	B-01	09/20/2017	brown (010YR-5/3) sand	0.40'	1.00'	CP-I	fine silty snad
0278	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0130 (N00500/W00550)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	BH	brick, coal, bottle glass
0279	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0130 (N00500/W00550)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	1.00'	1.15'	BH	
0280	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0131 (N00500/W00650)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.50'	JRN	small amount of pebbles
0281	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0131 (N00500/W00650)	B-01	09/20/2017	dark yellowish brown (010YR-4/4) sand	0.50'	1.65'	JRN	historic material - few pebbles
0282	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0131 (N00500/W00650)	C-01	09/20/2017	dark brown (010YR-3/3) sandy loam	1.65'	1.95'	JRN	reddish brick - dif - buried topsoil - no pebbles
0283	Area D. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0131 (N00500/W00650)	D-01	09/20/2017	yellowish brown (010YR-5/6) clay	1.95'	2.25'	JRN	compact subsoil
0284	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0132 (N00500/W00700)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.10'	CP-I	brick - dif - thin layer
0285	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0132 (N00500/W00700)	B-01	09/21/2017	dark yellowish brown (010YR-4/6) silty clay	1.10'	2.43'	CP-I	a few pebbles
0286	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0132 (N00500/W00700)	C-01	09/21/2017	olive (005Y -4/3) sandy clay	2.43'	2.70'	CP-I	some greenish clay with rock - excavated by post hole digger
0287	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0133 (N00500/W00750)	A-01	09/21/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	CP-I	gravel

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0288	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0133 (N00500/W00750)	B-01	09/21/2017	olive (005Y -4/3) sandy clay	0.30'	0.85'	CP-I	ironstone fragments
0289	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0134 (N00500/W01300)	A-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.00'	0.50'	BH	no topsoil - rounded gravel
0290	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0134 (N00500/W01300)	B-01	09/14/2017	yellowish brown (010YR-5/8) sand mottled with (- - /:) sandy clay	0.50'	2.70'	BH	loose sand and gravel with greenish clayey sand (marl) - used post hole digger
0291	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0135 (N00500/W01350)	A-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.00'	0.50'	BH	no topsoil - gravel stars at 0.2 feet - area is cut
0292	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0136 (N00500/W01400)	A-01	09/14/2017	dark yellowish brown (010YR-3/4) loam	0.00'	0.45'	BH	shallow topsoil
0293	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0136 (N00500/W01400)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.45'	0.50'	BH	gravelly - rounded quartz pebbles
0294	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0137 (N00500/W01450)	A-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.00'	0.90'	BH	aluminum can fragment -dif
0295	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0138 (N00500/W01500)	A-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.00'	2.25'	BH	appears to be cut and filled - no topsoil
0296	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0139 (N00500/W01550)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.55'	BH	
0297	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0139 (N00500/W01550)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) loamy sand	0.55'	0.95'	BH	some rounded quartz pebbles and ironstone gravel
0298	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0140 (N00500/W01600)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.60'	BH	few pebbles
0299	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0140 (N00500/W01600)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.60'	1.00'	BH	subsoil - rounded quartz pebbles
0300	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0141 (N00500/W01650)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	a few pebbles

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0301	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0141 (N00500/W01650)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.50'	1.00'	BH	
0302	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0142 (N00500/W01700)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.55'	BH	three pieces of coal - dif
0303	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0142 (N00500/W01700)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.55'	0.80'	BH	
0304	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0143 (N00500/W01750)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	some pebbles
0305	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0143 (N00500/W01750)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy loam	0.50'	0.75'	BH	
0306	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0144 (N00500/W01800)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.55'	BH	some rounded pebbles
0307	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0144 (N00500/W01800)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) loamy sand	0.55'	0.65'	BH	
0308	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0145 (N00500/W01850)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	not a clean break between A and B - some rounded pebbles
0309	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0145 (N00500/W01850)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) loamy sand	0.50'	1.05'	BH	
0310	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0146 (N00500/W01900)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	
0311	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0146 (N00500/W01900)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) loamy sand	0.50'	1.00'	BH	<10 rounded pebbles
0312	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0147 (N00500/W01950)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.95'	BH	
0313	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0147 (N00500/W01950)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) loamy sand	0.95'	1.10'	BH	

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0314	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0148 (N00500/W02000)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.19'	CP-I	2 window glass fragments
0315	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0149 (N00500/W02050)	A-01	09/13/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.60'	JRN	
0316	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0149 (N00500/W02050)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.60'	0.65'	JRN	did not screen
0317	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0150 (N00500/W02100)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.90'	BH	
0318	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0150 (N00500/W02100)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) clay loam	0.90'	1.10'	BH	
0319	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0151 (N00500/W02300)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	brick (2) and coal (3) - dif
0320	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0152 (N00500/W02350)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.90'	BH	
0321	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0152 (N00500/W02350)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) clay loam	0.90'	1.00'	BH	
0322	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0153 (N00500/W02400)	A-01	09/13/2017	brown/dark brown (010YR-4/3) loam	0.00'	0.70'	JRN	1 piece of coal - dif
0323	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0153 (N00500/W02400)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.70'	0.75'	JRN	did not screen
0324	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0154 (N00550/W02300)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.92'	CP-I	1 piece of coal and some asphalt - dif - iron oxide banding as base of stratum
0325	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0155 (N00550/W02350)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.10'	CP-I	asphalt - dif - more rocks on stratum
0326	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0156 (N00550/W02400)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.95'	JRN	

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0327	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0156 (N00550/W02400)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.95'	1.00'	JRN	did not screen
0328	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0157 (N00600/W00000)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.50'	BH, CP-I	brick, coal - few stones or pebbles
0329	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0157 (N00600/W00000)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	1.50'	2.20'	BH, CP-I	subtle transition between A and B - some rounded pebbles
0330	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0158 (N00600/W00050)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.30'	JRN	fine sand
0331	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0158 (N00600/W00050)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	1.30'	1.70'	JRN	two pebbles
0332	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0159 (N00600/W00100)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	BH, CP-I	tar, coal - some rounded pebbles
0333	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0159 (N00600/W00100)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	1.00'	1.60'	BH, CP-I	fine sand - slight change from A to B
0334	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0160 (N00600/W00150)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.90'	JRN, LB	coal
0335	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0160 (N00600/W00150)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.90'	1.55'	JRN	small amount of charcoal noted
0336	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0161 (N00600/W00200)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.85'	JRN	
0337	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0161 (N00600/W00200)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.85'	1.50'	JRN	no pebbles
0338	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0162 (N00600/W00250)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	BH, CP-I	
0339	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0162 (N00600/W00250)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	1.00'	1.50'	BH, CP-I	fine sand - a single pebble

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0340	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0163 (N00600/W00300)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	JRN, LB	
0341	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0163 (N00600/W00300)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.75'	1.50'	JRN, LB	brick, coal
0342	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0164 (N00600/W00350)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.55'	CP-I	sharp break between A and B
0343	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0164 (N00600/W00350)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.55'	1.40'	CP-I	fine sand - more compacted at bottom of unit
0344	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0165 (N00600/W00400)	A-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.00'	0.40'	BH	possible lithic, slag
0345	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0165 (N00600/W00400)	B-01	09/12/2017	light olive brown (2.5Y -5/4) sand	0.40'	2.80'	BH	no rocks or pebbles
0346	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0166 (N00600/W00450)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.20'	BH	some pebbles - green sand/marl
0347	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0166 (N00600/W00450)	B-01	09/12/2017	brown/dark brown (010YR-4/3) loamy sand mottled with dark yellowish brown (010YR-3/6) loamy sand	0.20'	0.65'	BH	coal (<.5g) - plow scars
0348	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0166 (N00600/W00450)	C-01	09/12/2017	light olive brown (2.5Y -5/4) sand	0.65'	1.40'	BH	no pebbles
0349	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0167 (N00600/W00500)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.40'	CP-I	subtle change from A to B
0350	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0167 (N00600/W00500)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.40'	0.60'	CP-I	fine sand - possible plow scars
0351	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0167 (N00600/W00500)	C-01	09/12/2017	light yellowish brown (010YR-6/4) loamy sand	0.60'	1.30'	CP-I	like beach sand - loose and granular
0352	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0168 (N00600/W00550)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.50'	JRN	

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0353	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0168 (N00600/W00550)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.50'	0.85'	JRN	fill layer - possible FCR fragment - similar to subsoil
0354	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0168 (N00600/W00550)	C-01	09/12/2017	brown/dark brown (010YR-4/3) loamy sand	0.85'	1.50'	JRN	buried topsoil
0355	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0168 (N00600/W00550)	D-01	09/12/2017	dark yellowish brown (010YR-4/4) loamy sand	1.50'	2.00'	JRN	subsoil - deposit became more clayey with depth
0356	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0169 (N00600/W00600)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.50'	BH	fill layer - windpw glass and plastic - dif
0357	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0169 (N00600/W00600)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.50'	1.25'	BH	fill layer
0358	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0169 (N00600/W00600)	C-01	09/12/2017	dark brown (010YR-3/3) loamy sand	1.25'	2.50'	BH	buried topsoil layer - some rounded pebbles
0359	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0169 (N00600/W00600)	D-01	09/12/2017	dark yellowish brown (010YR-4/4) clay	2.50'	2.80'	BH	
0360	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0170 (N00600/W00650)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.35'	CP-I	very few pebbles
0361	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0170 (N00600/W00650)	B-01	09/12/2017	yellowish brown (010YR-5/4) loamy sand	0.35'	0.90'	CP-I	small piece of window glass and brick - dif
0362	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0170 (N00600/W00650)	C-01	09/12/2017	light yellowish brown (010YR-6/4) loamy sand	0.90'	1.90'	CP-I	coal
0363	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0170 (N00600/W00650)	D-01	09/12/2017	yellowish brown (010YR-5/8) clay mottled with yellowish brown (010YR-5/8) loamy sand	1.90'	2.20'	CP-I	oxide banding
0364	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0171 (N00600/W00700)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.40'	JRN	tiny plastic fragment - dif - more gravel than prior tests
0365	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0171 (N00600/W00700)	B-01	09/12/2017	brown/dark brown (010YR-4/3) loamy sand	0.40'	1.75'	JRN	slate, coal - some mottling at base of layer

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0366	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0171 (N00600/W00700)	C-01	09/12/2017	very dark gray (010YR-3/1) clay loam mottled with dark brown (010YR-3/3) clay loam	1.75'	1.80'	JRN	hydric soils
0367	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0172 (N00600/W00750)	A-01	09/12/2017	very dark grayish brown (010YR-3/2) loamy sand	0.00'	0.55'	BH	stainless steel wire - dif
0368	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0172 (N00600/W00750)	B-01	09/12/2017	light yellowish brown (010YR-6/4) sand	0.55'	0.80'	BH	
0369	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0172 (N00600/W00750)	C-01	09/12/2017	dark yellowish brown (010YR-4/6) loamy sand mottled with very dark gray (010YR-3/1) loamy sand	0.80'	0.90'	BH	hydric soils
0370	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0173 (N00600/W00800)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	a few asphalt frags. - dif
0371	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0173 (N00600/W00800)	B-01	09/12/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.80'	JRN	asphalt - dif - some mottling - fill stratum
0372	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0173 (N00600/W00800)	C-01	09/12/2017	strong brown (7.5YR-4/6) clay loam mottled with very dark gray (010YR-3/1) clay loam	0.80'	1.10'	JRN	lensing of soils
0373	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0173 (N00600/W00800)	D-01	09/12/2017	olive gray (005Y -4/2) clay	1.10'	1.20'	JRN	hydric soil
0374	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0174 (N00600/W00850)	A-01	09/12/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.65'	CP-I	asphalt and plastic - dif - gravel and rocks
0375	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0174 (N00600/W00850)	B-01	09/12/2017	yellowish brown (010YR-5/8) sandy clay loam	0.65'	0.80'	CP-I	more compact - with iron oxide banding
0376	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0174 (N00600/W00850)	C-01	09/12/2017	dark brown (010YR-3/3) clay	0.80'	1.15'	CP-I	compact
0377	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0174 (N00600/W00850)	D-01	09/12/2017	yellowish brown (010YR-5/4) sandy clay loam	1.15'	1.30'	CP-I	
0378	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0175 (N00600/W00950)	A-01	09/12/2017	dark yellowish brown (010YR-4/6) loamy sand mottled with dark brown (010YR-3/3) loamy sand	0.00'	0.55'	BH	possible lithic - also asphalt - some gravel

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0379	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0175 (N00600/W00950)	B-01	09/12/2017	brown/dark brown (010YR-4/3) loam	0.55'	0.75'	BH	
0380	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0175 (N00600/W00950)	C-01	09/12/2017	black (010YR-2/1) loam mottled with dark yellowish brown (010YR-4/6) loam	0.75'	1.30'	BH	hydric soils
0381	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0175 (N00600/W00950)	D-01	09/12/2017	yellowish brown (010YR-5/8) clay loam mottled with brown (010YR-5/3) clay loam	1.30'	1.70'	BH	compact with banding
0382	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0176 (N00600/W01000)	A-01	09/12/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	asphalt - dif - possible argillite flakes - historic material
0383	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0176 (N00600/W01000)	B-01	09/12/2017	very dark grayish brown (2.5Y -3/2) clay loam mottled with strong brown (7.5YR-4/6) clay loam	0.80'	1.60'	JRN	coal and brick fragments - dif
0384	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0176 (N00600/W01000)	C-01	09/12/2017	dark yellowish brown (010YR-4/6) sandy clay loam	1.60'	1.70'	JRN	did not excavate
0385	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0177 (N00600/W01050)	A-01	09/13/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/6) loamy sand	0.00'	1.05'	BH	flood plain deposits
0386	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0177 (N00600/W01050)	B-01	09/13/2017	dark yellowish brown (010YR-4/4) sand mottled with yellowish brown (010YR-5/8) sand	1.05'	1.20'	BH	flood plain deposits
0387	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0178 (N00600/W01100)	A-01	09/13/2017	dark yellowish brown (010YR-4/4) loamy sand	0.00'	0.80'	JRN	coal - dif - gravel - compact stratum
0388	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0178 (N00600/W01100)	B-01	09/13/2017	dark yellowish brown (010YR-4/4) sandy loam mottled with dark grayish brown (010YR-4/2) sandy loam	0.80'	1.80'	JRN	mottled, compacy deposit - slight difference with A - lumps of clay toward bottom of deposit
0389	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0178 (N00600/W01100)	C-01	09/13/2017	olive gray (005Y -4/2) sand	1.80'	1.85'	JRN	coarse sand
0390	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0179 (N00600/W01150)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	CP-I	gravel present

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0391	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0179 (N00600/W01150)	B-01	09/13/2017	yellowish brown (010YR-5/4) loamy sand	0.30'	0.61'	CP-I	fine sand - compact with more gravel
0392	Area B. Floodplain and crossing of Mason Creek	Unit C - Recent fill and Unassigned	ST #0179 (N00600/W01150)	C-01	09/13/2017	olive gray (005Y -4/2) sandy clay	0.61'	1.85'	CP-I	greenish compact granular sandy clay deposit - orange banding
0393	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0180 (N00600/W01200)	A-01	09/13/2017	dark yellowish brown (010YR-3/4) sandy loam	0.00'	0.55'	BH	
0394	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0180 (N00600/W01200)	B-01	09/13/2017	dark olive gray (005Y -3/2) sand mottled with yellowish brown (010YR-5/6) sand	0.55'	1.50'	BH	compact at start - with pebbles, ironstone gravel
0395	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0180 (N00600/W01200)	C-01	09/13/2017	light yellowish brown (2.5Y -6/4) sand	1.50'	1.70'	BH	fine sand
0396	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0181 (N00600/W01250)	A-01	09/13/2017	dark yellowish brown (010YR-4/6) loam	0.00'	1.90'	JRN	heavy gravel - compact - screened a portion of deposit
0397	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0181 (N00600/W01250)	B-01	09/13/2017	yellowish brown (010YR-5/6) sandy clay loam mottled with olive (005Y -4/3) sandy clay loam	1.90'	2.20'	JRN	coarse sand with gravel
0398	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0182 (N00600/W01300)	A-01	09/13/2017	dark yellowish brown (010YR-4/6) loamy sand	0.00'	0.55'	BH	some pebbles
0399	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0182 (N00600/W01300)	B-01	09/13/2017	yellowish brown (010YR-5/8) sand mottled with dark gray (010YR-4/1) sand	0.55'	1.05'	BH	loose coarse sand - primarily 10YR5/8
0400	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0182 (N00600/W01300)	C-01	09/13/2017	dark olive (005Y -3/4) sand mottled with strong brown (7.5YR-5/8) sand	1.05'	2.20'	BH	some banding
0401	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0183 (N00600/W01350)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	CP-I	gravel and pebbles
0402	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0183 (N00600/W01350)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sand	0.75'	1.00'	CP-I	coarse sand
0403	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0184 (N00600/W01400)	A-01	09/13/2017	dark yellowish brown (010YR-4/4) loam	0.00'	0.65'	JRN	compact with gravel

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0404	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0184 (N00600/W01400)	B-01	09/13/2017	yellowish red (005YR-4/6) loamy sand	0.65'	0.70'	JRN	
0405	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0185 (N00600/W01450)	A-01	09/13/2017	dark yellowish brown (010YR-3/4) loamy sand	0.00'	0.60'	BH	
0406	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0185 (N00600/W01450)	B-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.60'	1.10'	BH	relatively heavy gravel - rounded quartz pebbles
0407	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0185 (N00600/W01450)	C-01	09/13/2017	dark yellowish brown (010YR-4/6) sand	1.10'	1.60'	BH	
0408	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0186 (N00600/W01500)	A-01	09/13/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	1.20'	JRN	deposit is more similar to tests at eastern end of line
0409	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0186 (N00600/W01500)	B-01	09/13/2017	brown/dark brown (7.5YR-4/4) sandy clay loam	1.20'	1.85'	JRN	few stone or pebbles
0410	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0187 (N00600/W01550)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	asphalt and coal - dif - jasper flake recovered - thick topsoil
0411	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0187 (N00600/W01550)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.95'	1.30'	CP-I	depsoit below B is slightly lighter
0412	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0188 (N00600/W01600)	A-01	09/13/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.60'	BH	
0413	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0188 (N00600/W01600)	B-01	09/13/2017	yellowish brown (010YR-5/6) loamy sand	0.60'	1.60'	BH	compact deposit - relatively heavy gravel content
0414	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0188 (N00600/W01600)	C-01	09/13/2017	dark yellowish brown (010YR-4/6) sand	1.60'	1.70'	BH	coarse sand and gravel
0415	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0189 (N00600/W01650)	A-01	09/13/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.85'	JRN	compact toward bottom
0416	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0189 (N00600/W01650)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.85'	1.25'	JRN	brick frag (1) - dif - compact - few stones or pebbles

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0417	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0190 (N00600/W01700)	A-01	09/13/2017	very dark grayish brown (010YR-3/2) loam	0.00'	0.80'	BH	possible flake - brick (<1.0g) - dif
0418	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0190 (N00600/W01700)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) loamy sand	0.80'	1.35'	BH	nail and brick - dif - compact sand - no gravel
0419	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0191 (N00600/W01750)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.58'	CP-I	glass - dif
0420	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0191 (N00600/W01750)	B-01	09/13/2017	yellowish brown (010YR-5/4) sandy clay	0.58'	1.20'	CP-I	thick deposit
0421	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0192 (N00600/W01800)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.50'	BH	coal - dif
0422	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0192 (N00600/W01800)	B-01	09/13/2017	yellowish brown (010YR-5/6) loamy sand	0.50'	1.20'	BH	with gravel
0423	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0193 (N00600/W01850)	A-01	09/13/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.15'	JRN	
0424	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0193 (N00600/W01850)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.15'	0.70'	JRN	compact deposit - very few stones or pebbles
0425	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0194 (N00600/W01900)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.35'	CP-I	sheet vinyl - white - dif
0426	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0194 (N00600/W01900)	B-01	09/13/2017	yellowish brown (010YR-5/4) sandy clay loam	0.35'	0.95'	CP-I	compact - a few pebbles
0427	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0195 (N00600/W01950)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.20'	BH	
0428	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0195 (N00600/W01950)	B-01	09/13/2017	dark yellowish brown (010YR-3/4) loamy sand mottled with brown/dark brown (010YR-4/3) -	0.20'	0.80'	BH	gravelly
0429	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0195 (N00600/W01950)	C-01	09/13/2017	dark yellowish brown (010YR-3/4) loamy sand mottled with brown/dark brown (010YR-4/3) loamy sand	0.80'	0.90'	BH	similar to be but lacking gravel

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0430	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0196 (N00600/W02000)	A-01	09/13/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.95'	JRN	
0431	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0196 (N00600/W02000)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.95'	1.35'	JRN	compact with few stones or pebbles
0432	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0197 (N00600/W02050)	A-01	09/13/2017	very dark grayish brown (010YR-3/2) loam	0.00'	0.85'	BH	
0433	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0197 (N00600/W02050)	B-01	09/13/2017	dark yellowish brown (010YR-4/4) clay loam	0.85'	1.20'	BH	no gravel
0434	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0198 (N00600/W02100)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.89'	CP-I	thick topsoil - a few pebbles
0435	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0199 (N00600/W02150)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	JRN	single piece of coal ash and brick - dif
0436	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0199 (N00600/W02150)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.75'	0.80'	JRN	did not screen subsoil
0437	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0200 (N00600/W02200)	A-01	09/13/2017	dark brown (010YR-3/3) clay loam	0.00'	0.70'	BH	coal - dif
0438	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0200 (N00600/W02200)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy loam	0.70'	0.80'	BH	
0439	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0201 (N00600/W02250)	A-01	09/13/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.65'	JRN	brick fragment - dif - few rocks
0440	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0201 (N00600/W02250)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.65'	0.70'	JRN	did not screen
0441	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0202 (N00600/W02300)	A-01	09/13/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.85'	CP-I	brick fragment - few pebbles
0442	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0203 (N00600/W02350)	A-01	09/13/2017	dark brown (010YR-3/3) loam	0.00'	0.80'	BH	

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0443	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0203 (N00600/W02350)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) clay loam	0.80'	1.00'	BH	
0444	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0204 (N00600/W02400)	A-01	09/13/2017	brown/dark brown (010YR-4/3) loam	0.00'	0.85'	JRN	very few rocks or pebbles
0445	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0204 (N00600/W02400)	B-01	09/13/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.85'	0.90'	JRN	did not screen
0446	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0205 (N00650/W00000)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	1.20'	BH	a few pebbles
0447	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0205 (N00650/W00000)	B-01	09/18/2017	yellowish brown (010YR-5/6) sandy loam	1.20'	1.70'	BH	window glass, brick
0448	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0206 (N00650/W00050)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	1.20'	BH	brick, coal - limestone fragment - discarded in lab
0449	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0206 (N00650/W00050)	B-01	09/18/2017	yellowish brown (010YR-5/6) sandy loam	1.20'	1.70'	BH	
0450	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0207 (N00650/W00100)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	1.15'	BH	
0451	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0207 (N00650/W00100)	B-01	09/18/2017	yellowish brown (010YR-5/6) silty clay loam	1.15'	1.65'	BH	
0452	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0208 (N00650/W00150)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	0.95'	BH	coal, brick - quartz pebble - non-cultural?
0453	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0208 (N00650/W00150)	B-01	09/18/2017	yellowish brown (010YR-5/6) sandy loam	0.95'	1.40'	BH	
0454	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0209 (N00650/W00200)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	0.70'	BH	brick - dif
0455	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0209 (N00650/W00200)	B-01	09/18/2017	yellowish brown (010YR-5/6) sandy loam	0.70'	1.10'	BH	no stones or pebbles

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0456	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0210 (N00650/W00250)	A-01	09/18/2017	dark brown (010YR-3/3) loam	0.00'	0.60'	BH	brick fragment - dif
0457	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0210 (N00650/W00250)	B-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	0.60'	0.95'	BH	
0458	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0211 (N00650/W00300)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.20'	BH	thin topsoil - graded for runway?
0459	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0211 (N00650/W00300)	B-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.20'	0.90'	BH	banded sandy soil - some mudstone pebbles
0460	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0212 (N00650/W00350)	A-01	09/18/2017	dark yellowish brown (010YR-4/4) loamy sand mottled with yellowish brown (010YR-5/4) loamy sand	0.00'	0.20'	BH	lighting glass
0461	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0212 (N00650/W00350)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.20'	1.25'	BH	
0462	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0213 (N00650/W00400)	A-01	09/18/2017	yellowish brown (010YR-5/4) loamy sand	0.00'	0.40'	BH	coal - dif
0463	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0213 (N00650/W00400)	B-01	09/18/2017	light yellowish brown (010YR-6/4) sand	0.40'	1.25'	BH	
0464	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0214 (N00650/W00450)	A-01	09/18/2017	yellowish brown (010YR-5/4) loamy sand	0.00'	0.50'	BH	brick - dif
0465	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0214 (N00650/W00450)	B-01	09/18/2017	light yellowish brown (010YR-6/4) -	0.50'	1.20'	BH	
0466	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0215 (N00650/W00500)	A-01	09/20/2017	dark yellowish brown (010YR-3/4) loamy sand	0.00'	0.35'	JRN	slightly darker at top
0467	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0215 (N00650/W00500)	B-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.35'	0.75'	JRN	a few rounded quartz pebbles
0468	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0216 (N00650/W00550)	A-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/4) sand	0.00'	0.60'	JRN	fill layer - 1 coal, coal ash - dif

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0469	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0216 (N00650/W00550)	B-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.60'	1.80'	JRN	2 coal (dif), brick, prehistoric flake
0470	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0216 (N00650/W00550)	C-01	09/20/2017	yellowish brown (010YR-5/4) sandy clay loam	1.80'	2.25'	JRN	1 charcoal frag - dif
0471	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0217 (N00650/W00600)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.20'	CP-I	modern debris
0472	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0217 (N00650/W00600)	B-01	09/20/2017	dark yellowish brown (010YR-4/6) sandy loam	1.20'	1.95'	CP-I	window glass, brick - dif
0473	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0217 (N00650/W00600)	C-01	09/20/2017	brown (010YR-5/3) sand	1.95'	2.45'	CP-I	
0474	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0218 (N00650/W00650)	A-01	09/20/2017	dark brown (010YR-3/3) loam	0.00'	1.20'	BH	slight mottling - glass, plastic, brick - dif
0475	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0218 (N00650/W00650)	B-01	09/20/2017	dark yellowish brown (010YR-4/6) clay loam	1.20'	2.60'	BH	brick, and coal - buried topsoil layer
0476	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0218 (N00650/W00650)	C-01	09/20/2017	yellowish brown (010YR-5/6) clay loam	2.60'	2.80'	BH	
0477	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0219 (N00650/W01250)	A-01	09/14/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.60'	CP-I, JRN	some rounded pebbles
0478	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0219 (N00650/W01250)	B-01	09/14/2017	yellowish brown (010YR-5/6) sandy clay loam	0.60'	0.65'	CP-I, JRN	did not screen
0479	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0220 (N00650/W01300)	A-01	09/14/2017	strong brown (7.5YR-4/6) loamy sand	0.00'	0.40'	JRN	angular plastic fragment - dif - no topsoil - with relatively many pebbles
0480	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0221 (N00650/W01350)	A-01	09/14/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.74'	CP-I	1 unidentifiable iron nail or wire - dif - thin topsoil - cut to subsoil
0481	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0222 (N00650/W01400)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	0.90'	BH	

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0482	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0222 (N00650/W01400)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) sandy clay loam	0.90'	1.10'	BH	very few pebbles
0483	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0223 (N00675/W00300)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.54'	CP-I	1 piece of coal and brick - dif
0484	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0223 (N00675/W00300)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.54'	1.15'	CP-I	some dark brown banding with clay content
0485	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0224 (N00675/W00375)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	BH	
0486	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0224 (N00675/W00375)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.30'	0.95'	BH	
0487	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0225 (N00675/W00400)	A-01	09/18/2017	yellowish brown (010YR-5/4) sandy loam	0.00'	0.35'	BH	brick - dif - thin sod layer - at edge of cut area
0488	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0225 (N00675/W00400)	B-01	09/18/2017	light yellowish brown (010YR-6/4) sand	0.35'	1.60'	BH	lithic
0489	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0226 (N00675/W00425)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.27'	BH	
0490	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0226 (N00675/W00425)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.27'	0.80'	BH	1 piece of charcoal noted
0491	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0227 (N00700/W00000)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.95'	CP-I	a few small brick fragments - dif - very few pebbles - thick topsoil - sharp break with underlying soil
0492	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0228 (N00700/W00050)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.65'	CP-I	1 small brick fragment <1.0 gram - dif
0493	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0228 (N00700/W00050)	B-01	09/18/2017	yellowish brown (010YR-5/6) silt loam	0.65'	0.97'	CP-I	
0494	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0229 (N00700/W00100)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.85'	CP-I	thick topsoil layer

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0495	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0230 (N00700/W00150)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.94'	CP-I	thick topsoil layer - few pebbles - aqua bottle glass fragment
0496	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0231 (N00700/W00200)	A-01	09/19/2017	dark brown (010YR-3/3) sandy loam	0.00'	1.10'	CP-I	few pebles - thick topsoil stratum
0497	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0232 (N00700/W00250)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	small pieces of coal and brick - a few rocks
0498	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0233 (N00700/W00275)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	BH	
0499	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0233 (N00700/W00275)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.75'	1.40'	BH	
0500	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0234 (N00700/W00300)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.79'	CP-I	1 prehistoric waste flake - a few pebbles
0501	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0234 (N00700/W00300)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.79'	1.00'	CP-I	a few pebbles
0502	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0235 (N00700/W00325)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.79'	CP-I	coal and brick
0503	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0235 (N00700/W00325)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.79'	1.20'	CP-I	
0504	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0236 (N00700/W00350)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.09'	CP-I	thick topsoil, brick - dif - few stones or pebbles
0505	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0236 (N00700/W00350)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	1.09'	1.40'	CP-I	1 brick fragment in subsoil - dif
0506	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0237 (N00700/W00375)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	thick topsoil - 1 piece of brick - dif
0507	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0237 (N00700/W00375)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	1.00'	1.85'	CP-I	a few pebbles

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0508	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0238 (N00700/W00400)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.90'	CP-I	2 prehistoric waste flakes - a few pebbles
0509	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0238 (N00700/W00400)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.90'	1.70'	CP-I	sone dark brown clayey sand streaking
0510	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0239 (N00700/W00425)	A-01	09/18/2017	yellowish brown (010YR-5/4) loamy sand	0.00'	0.80'	BH	radial test
0511	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0239 (N00700/W00425)	B-01	09/18/2017	light yellowish brown (010YR-6/4) sand	0.80'	2.20'	BH	lithic
0512	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0240 (N00700/W00450)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.70'	BH	redware
0513	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0240 (N00700/W00450)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.70'	1.65'	BH	
0514	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0241 (N00700/W00475)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	BH	brick
0515	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0241 (N00700/W00475)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	1.00'	2.10'	BH	lithic recovered
0516	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0242 (N00700/W00500)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	a flakes and metal recovered - mix of stones and pebbles - sharp break with stratum B
0517	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0242 (N00700/W00500)	B-01	09/20/2017	brown (010YR-5/3) sand	1.00'	1.66'	CP-I	
0518	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0243 (N00700/W00525)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.85'	CP-I	1 piece of coal
0519	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0243 (N00700/W00525)	B-01	09/20/2017	brown (010YR-5/3) sand	0.85'	1.40'	CP-I	a few pebbles
0520	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0244 (N00700/W00550)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	a few pebbles

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0521	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0244 (N00700/W00550)	B-01	09/20/2017	brown (010YR-5/3) sand	0.95'	1.55'	CP-I	1 pebble
0522	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0245 (N00700/W00600)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.70'	BH	plastic - dif
0523	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0245 (N00700/W00600)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.70'	1.40'	BH	brick - dif
0524	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0246 (N00700/W00650)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.60'	BH	plastic, glass, styrofoam
0525	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0246 (N00700/W00650)	B-01	09/20/2017	dark yellowish brown (010YR-4/6) clay loam mottled with dark yellowish brown (010YR-3/4) clay loam	0.60'	1.40'	BH	nail
0526	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0247 (N00700/W01300)	A-01	09/14/2017	dark brown (010YR-3/3) loam	0.00'	1.30'	BH	gradual transition to subsoil - slight mottling
0527	Area A. West of Masons Creek	Unit C - Recent fill and Unassigned	ST #0247 (N00700/W01300)	B-01	09/14/2017	dark yellowish brown (010YR-4/6) loamy sand	1.30'	1.50'	BH	
0528	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0248 (N00725/W00225)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	2 brick fragments - dif - very few pebbles
0529	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0248 (N00725/W00225)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.90'	JRN	coal - dif
0530	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0248 (N00725/W00225)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sand	0.90'	1.30'	JRN	tiny coal fragment - dif - slight mottling near base
0531	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0249 (N00725/W00250)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand mottled with dark yellowish brown (010YR-4/6) loamy sand	0.00'	1.00'	BH	lithic and historic (brick - 4, and coal - 4)-dif
0532	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0249 (N00725/W00250)	B-01	09/18/2017	yellowish brown (010YR-5/4) sand	1.00'	2.05'	BH	lithics (possibly from interface)
0533	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0250 (N00725/W00275)	A-01	09/18/2017	dark brown (010YR-3/3) loam mottled with dark yellowish brown (010YR-4/6) loamy sand	0.00'	1.20'	BH	brick (3), coal (1) - dif

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0534	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0250 (N00725/W00275)	B-01	09/18/2017	yellowish brown (010YR-5/4) sand	1.20'	2.25'	BH	
0535	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0251 (N00725/W00300)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.13'	CP-I	1 lithic, brick - a few pebbles
0536	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0251 (N00725/W00300)	B-01	09/18/2017	yellowish brown (010YR-5/6) sandy clay	1.13'	1.50'	CP-I	a few pieces of brick, 1 coal frag. - dif - sand with small amount of clay
0537	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0252 (N00725/W00325)	A-01	09/18/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	1 ceramic - brick - thick deposit - few pebbles
0538	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0252 (N00725/W00325)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	1.00'	1.55'	CP-I	
0539	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0253 (N00725/W00375)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.00'	CP-I	brick (2), coal - thick topsoil layer
0540	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0253 (N00725/W00375)	B-01	09/20/2017	brown (010YR-5/3) sand	1.00'	1.60'	CP-I	lithic
0541	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0254 (N00725/W00400)	A-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.80'	JRN	brick (1) - dif
0542	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0254 (N00725/W00400)	B-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.80'	1.40'	JRN	redware, quartz core(?) - almost no pebbles
0543	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0255 (N00725/W00425)	A-01	09/20/2017	dark yellowish brown (010YR-3/4) loamy sand	0.00'	0.30'	JRN	brick (1) -dif
0544	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0255 (N00725/W00425)	B-01	09/20/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	0.90'	JRN	lithics - A grades into B - very few pebbles
0545	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0255 (N00725/W00425)	C-01	09/20/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sand	0.90'	1.80'	JRN	lithic - no pebbles or stones
0546	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0256 (N00725/W00450)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.80'	BH	lithic and historic

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0547	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0256 (N00725/W00450)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.80'	1.80'	BH	
0548	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0257 (N00725/W00475)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	BH	nail
0549	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0257 (N00725/W00475)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.75'	2.20'	BH	lithics, ceramic
0550	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0258 (N00725/W00475)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.70'	BH	nail
0551	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0258 (N00725/W00475)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.70'	1.65'	BH	lithics
0552	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0259 (N00725/W00500)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	bottle glass
0553	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0259 (N00725/W00500)	B-01	09/20/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	0.80'	JRN	lithics
0554	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0259 (N00725/W00500)	C-01	09/20/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sand	0.80'	1.80'	JRN	small brick frag (<1.0g) - dif
0555	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0260 (N00725/W00525)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.90'	BH	brick, coal, unident iron - dif
0556	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0260 (N00725/W00525)	B-01	09/20/2017	dark yellowish brown (010YR-4/6) sand	0.90'	1.85'	BH	
0557	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0261 (N00725/W00550)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.15'	CP-I	no pebbles
0558	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0261 (N00725/W00550)	B-01	09/20/2017	brown (010YR-5/3) sand	1.15'	1.77'	CP-I	
0559	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0262 (N00725/W00575)	A-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.00'	0.90'	JRN	

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0560	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0262 (N00725/W00575)	B-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.90'	1.45'	JRN	subsoil
0561	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0263 (N00750/W00000)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	brick (1)coal, coal ash - dif
0562	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0263 (N00750/W00000)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.85'	JRN	a few pebbles
0563	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0263 (N00750/W00000)	C-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	0.85'	0.90'	JRN	did not screen
0564	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0264 (N00750/W00050)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.20'	JRN	coal, modern amber glass fragment (1) - dif - a few pebbles
0565	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0264 (N00750/W00050)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.20'	1.10'	JRN	1 plate window glass fragment
0566	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0264 (N00750/W00050)	C-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	1.10'	1.50'	JRN	few pebbles
0567	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0265 (N00750/W00100)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	
0568	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0265 (N00750/W00100)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.80'	JRN	coal (3) - dif
0569	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0265 (N00750/W00100)	C-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	0.80'	0.85'	JRN	did not screen
0570	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0266 (N00750/W00150)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	coal (2) - dif
0571	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0266 (N00750/W00150)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.95'	JRN	coal, brick, redware
0572	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0266 (N00750/W00150)	C-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	0.95'	1.00'	JRN	did not screen

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0573	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0267 (N00750/W00200)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	
0574	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0267 (N00750/W00200)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	1.15'	JRN	coal (9), small brick fragment - dif
0575	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0267 (N00750/W00200)	C-01	09/18/2017	yellowish brown (010YR-5/6) loamy sand	1.15'	1.20'	JRN	a few rounded pebbles
0576	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0268 (N00750/W00225)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	coal (2), brick - dif
0577	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0268 (N00750/W00225)	B-01	09/18/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	0.80'	JRN	glazed brick, coal fragment - very few pebbles
0578	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0268 (N00750/W00225)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.80'	1.25'	JRN	some orange sandy clay loam inclusions
0579	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0269 (N00750/W00250)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	stratum is thicker to north
0580	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0269 (N00750/W00250)	B-01	09/18/2017	dark yellowish brown (010YR-4/6) loamy sand	0.30'	0.60'	JRN	lithic, coal
0581	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0269 (N00750/W00250)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.60'	0.80'	JRN	2 rounded pebbles
0582	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0270 (N00750/W00275)	A-01	09/18/2017	brown/dark brown (010YR-4/3) sandy loam	0.00'	0.30'	JRN	lithic , brick
0583	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0270 (N00750/W00275)	B-01	09/18/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	1.20'	JRN	coal, brick
0584	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0270 (N00750/W00275)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sandy loam	1.20'	1.70'	JRN	no pebbles
0585	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0271 (N00750/W00300)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0586	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0271 (N00750/W00300)	B-01	09/18/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	1.10'	JRN	lithic, coal, brick, redware
0587	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0271 (N00750/W00300)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sandy clay loam	1.10'	1.90'	JRN	lithic - no pebbles - with dark brown marbling thoughout
0588	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0272 (N00750/W00325)	A-01	09/18/2017	dark yellowish brown (010YR-4/4) loamy sand	0.00'	0.80'	BH	coal, brick - dif
0589	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0272 (N00750/W00325)	B-01	09/18/2017	yellowish brown (010YR-5/6) sand	0.80'	1.50'	BH	
0590	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0273 (N00750/W00350)	A-01	09/18/2017	dark yellowish brown (010YR-3/4) loamy sand	0.00'	0.20'	JRN	
0591	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0273 (N00750/W00350)	B-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.20'	1.55'	JRN	no pebbles or stones
0592	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0274 (N00750/W00375)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.75'	CP-I	lithic - fair amount of pebbles
0593	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0274 (N00750/W00375)	B-01	09/20/2017	brown (010YR-5/3) sand	0.75'	0.90'	CP-I	thin dark brown clay(?) banding
0594	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0275 (N00750/W00400)	A-01	09/18/2017	dark brown (010YR-3/3) sandy loam	0.00'	0.30'	JRN	nail
0595	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0275 (N00750/W00400)	B-01	09/18/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	0.85'	JRN	1 partially burnt coal fragment
0596	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0275 (N00750/W00400)	C-01	09/18/2017	yellowish brown (010YR-5/4) sand	0.85'	1.20'	JRN	no pebbles
0597	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0276 (N00750/W00425)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	1 plate window glass frag. - dif
0598	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0276 (N00750/W00425)	B-01	09/20/2017	dark yellowish brown (010YR-4/4) loamy sand	0.30'	0.95'	JRN	lithic

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0599	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0276 (N00750/W00425)	C-01	09/20/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) sandy loam	0.95'	2.00'	JRN	lithic - orange marbling - no stones or pebbles
0600	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0277 (N00750/W00450)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.94'	CP-I	lithic, nail, coal - flake toward bottom of stratum
0601	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0277 (N00750/W00450)	B-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.94'	1.70'	CP-I	lithics, coal - soil slightly darker toward bottom of unit
0602	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0278 (N00750/W00475)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.95'	CP-I	lithics - few pebbles
0603	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0278 (N00750/W00475)	B-01	09/20/2017	brown (010YR-5/3) sand	0.95'	1.59'	CP-I	a few rounded pebbles
0604	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0279 (N00750/W00500)	A-01	09/20/2017	brown/dark brown (010YR-4/3) sand	0.00'	0.90'	JRN	lithics
0605	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0279 (N00750/W00500)	B-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.90'	1.65'	JRN	possible quartz flake
0606	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0280 (N00750/W00525)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	1.10'	BH	lithic, coal, brick, shell
0607	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0280 (N00750/W00525)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	1.10'	1.85'	BH	coal
0608	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0281 (N00750/W00550)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	very few pebbles
0609	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0281 (N00750/W00550)	B-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.95'	JRN	lithics, plastic, redware, brick
0610	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0281 (N00750/W00550)	C-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.95'	1.85'	JRN	lithic - no stones or pebbles
0611	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0282 (N00750/W00575)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
0612	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	ST #0282 (N00750/W00575)	B-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.90'	JRN	lithics
0613	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	ST #0282 (N00750/W00575)	C-01	09/20/2017	yellowish brown (010YR-5/4) sand	0.90'	1.30'	JRN	
0614	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0283 (N00750/W00600)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.80'	BH	bottle glass
0615	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0283 (N00750/W00600)	B-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.80'	1.90'	BH	
0616	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0284 (N00750/W00650)	A-01	09/20/2017	dark brown (010YR-3/3) loamy sand	0.00'	0.30'	JRN	styrofoam (1), amber bottle glass (1) - dif
0617	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0284 (N00750/W00650)	B-01	09/20/2017	brown/dark brown (010YR-4/3) loamy sand	0.30'	0.90'	JRN	1 piece of styrofoam - dif
0618	Area C. East of Masons Creek	Unit C - Recent fill and Unassigned	ST #0284 (N00750/W00650)	C-01	09/20/2017	yellowish brown (010YR-5/6) sand	0.90'	1.20'	JRN	no rocks or pebbles
1000	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0001 (N00753/W00497)	A-01	10/25/2017	dark yellowish brown (010YR-3/4) loamy sand	0.47'	0.80'	JRN	fine sand - across entire unit - fien roots throughout - includes sod - grades lighter with depth
1001	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0002 (N00753/W00472)	A-01	10/25/2017	dark brown (010YR-3/3) loamy sand	0.31'	0.63'	BH	over entire unit - includes sod - very few pebbles
1002	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0003 (N00753/W00447)	A-01	10/25/2017	dark yellowish brown (010YR-4/4) loamy sand	0.31'	0.66'	CPI	includes sod layer - over entire unit
1003	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0003 (N00753/W00447)	B-01	10/25/2017	dark yellowish brown (010YR-3/4) loamy sand	0.66'	1.23'	CPI	plow zone deposit - covers entire unit - below A, above C
1004	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0001 (N00753/W00497)	B-01	10/25/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/4) loamy sand	0.80'	1.24'	JRN	across entire unit - underlies A, overlies C - small blotches of yellowish brown - plow scars at base of stratum - oriented north-south
1005	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0002 (N00753/W00472)	B-01	10/25/2017	brown/dark brown (010YR-4/3) loamy sand mottled with yellowish brown (010YR-5/4) loamy sand	0.63'	1.07'	BH	plow zone - ends at subsoil - covers entire unit

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
1006	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0003 (N00753/W00447)	C-01	10/25/2017	yellowish brown (010YR-5/6) sand	1.24'	1.50'	CPI	slightly lighter than prior stratum - arbitrary level 3\
1007	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0002 (N00753/W00472)	C-01	10/25/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) loamy sand	1.08'	1.32'	BH	arbitrary 3-inch level - traces of iron oxidation in soil
1008	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0001 (N00753/W00497)	C-01	10/25/2017	yellowish brown (010YR-5/4) loamy sand mottled with brown/dark brown (010YR-4/3) loamy sand	1.31'	1.35'	JRN	transition to subsoil - with plow scars
1009	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0001 (N00753/W00497)	D-01	10/25/2017	light yellowish brown (010YR-6/4) sand mottled with yellowish brown (010YR-5/4) sand and dark brown (7.5YR-3/4) silt loam	1.35'	1.59'	JRN	subsoil - will be excavated in arbitrary 0.25-foot levels - no stones or roots
1010	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0003 (N00753/W00447)	C-02	10/25/2017	dark yellowish brown (010YR-4/4) sand	1.50'	1.75'	CPI	small pieces of quartizite and argillite - plus coal - a few rounded quartz pebbles
1011	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0003 (N00753/W00447)	D-01	10/26/2017	dark yellowish brown (010YR-3/4) sand	1.52'	1.83'	CPI	fine sand - roughly circular slightly darker area - darker soil more prevalent on se side
1012	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0002 (N00753/W00472)	C-02	10/26/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/6) loamy sand	1.32'	1.52'	BH	traces of iron oxidation - arbitrary level 0.25-foot
1013	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0001 (N00753/W00497)	D-02	10/26/2017	light yellowish brown (010YR-6/4) sand	1.59'	1.85'	JRN	second arbitrary level - mottling is virtually gone - no roots or pebbles - excavation ended
1014	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0004 (N00753/W00297)	A-01	10/26/2017	dark brown (010YR-3/3) sandy loam	0.23'	0.48'	BH	similar to EU2
1015	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0005 (N00753/W00272)	A-01	10/26/2017	very dark grayish brown (010YR-3/2) loamy sand	0.29'	0.45'	CPI	few pebbles
1016	Area C. 28-Bu-62 - East of Masons Creek	-	EU #0001 (N00753/W00497)	---	10/26/2017	(- - /:) -	0.00'	0.00'	JRN	north and west wall profiles
1017	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0004 (N00753/W00297)	B-01	10/26/2017	dark yellowish brown (010YR-4/4) loamy sand	0.48'	1.42'	BH	possible plow scars noted - running east/west
1018	Area C. 28-Bu-62 - East of Masons Creek	Unit A - Sod and Plowzone	EU #0005 (N00753/W00272)	B-01	10/26/2017	dark yellowish brown (010YR-4/4) sand	0.45'	1.28'	CPI	mixed historic and prehistoric material

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Catalog#	Project Area	Analytical Unit	Unit# - (Coordinates	Stratum -Level	Date	Soil Description	Opening Depth	Closing Depth	Excavators	Comments
1019	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0004 (N00753/W00297)	C-01	10/26/2017	yellowish brown (010YR-5/4) sand mottled with dark yellowish brown (010YR-4/4) sand	1.42'	1.52'	BH	transitional layer - some coal - discarded in field
1020	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0005 (N00753/W00272)	C-01	10/26/2017	light yellowish brown (010YR-6/4) sand	1.28'	1.54'	CPI	a few pebbles
1021	Area C. 28-Bu-62 - East of Masons Creek	Unit B - Transitional layer and Subsoil	EU #0004 (N00753/W00297)	D-01	10/26/2017	yellowish brown (010YR-5/4) sand	1.52'	1.77'	BH	arbitrary level in subsoil
1022	Area C. 28-Bu-62 - East of Masons Creek	Unit C - Recent fill and Unassigned	EU #0004 (N00753/W00297)	---	10/26/2017	(- - /:) -	0.00'	0.00'	BH, JRN	artifacts from unit recovered during cleaning for photographs
1023	Area C. 28-Bu-62 - East of Masons Creek		EU #0005 (N00753/W00272)	---	10/26/2017	(- - /:) -	0.00'	0.00'	CPI, JRN	profiles of east and south walls

APPENDIX D

Archaeological Inventory

D.1. Artifacts

D.2 Faunal Specimens

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area A. West of Masons Creek											
ST #0104 (N00450/W01950)											
Prehistoric Material											
0233.P001	A - 01	Tools-Biface - Projectile point-Archaic (PAA1000000) -	1	nearly whole - missing point - stone Grey argillite (M23010)				2.0	0.6	-	
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0234.C001	B - 01	nail - hand wrought/forged	1	shank - - - fe (iron) (E15080)						-	heavily rusted
		Totals: **Construction and Waste Material**	**1**								
		Totals: **ST #0104 (N00450/W01950)**	**2**								
ST #0109 (N00450/W02250)											
Household Ceramics											
0241.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0241.C000	A - 01	glazing (window glass) - plate	1	fragment - Colorless - glass (J20060)						-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**								
		Totals: **ST #0109 (N00450/W02250)**	**2**								
ST #0117 (N00455/W01600)											
Construction and Waste Material											
0254.C001	A - 01	nail - Wrought or Cut	1	head and shank - - - fe (iron) (E15080)						-	heavily rusted
		Totals: **Construction and Waste Material**	**1**								
		Totals: **ST #0117 (N00455/W01600)**	**1**								
ST #0138 (N00500/W01500)											
Household Ceramics											
0295.A001	A - 01	Unidentifiable - Creamware - undecorated - (007.00) -	1	body -						-	small chip
		Totals: **Household Ceramics**	**1**								
		Totals: **ST #0138 (N00500/W01500)**	**1**								

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area A. West of Masons Creek											
ST #0150 (N00500/W02100)											
Household Ceramics											
0317.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -	1	base with foot ring -						-	no interior surface
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0317.C000	A - 01	brick - molded	1	fragment - Red - brick (J20010)		8.1				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**8.1**					
		Totals: **ST #0150 (N00500/W02100)**	**2**			**8.1**					
ST #0187 (N00600/W01550)											
Prehistoric Material											
0410.P002	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Grey chalcedony (K21030)						-	
0410.P001	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
		Totals: **Prehistoric Material**	**2**								
Construction and Waste Material											
0410.C002	A - 01	nail - Wrought or Cut	1	head and shank - - - fe (iron) (E15080)						-	rusted
0410.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		0.7				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**0.7**					
		Totals: **ST #0187 (N00600/W01550)**	**6**			**0.7**					
ST #0189 (N00600/W01650)											
Prehistoric Material											
0415.P001	A - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - silicates (natural) Grey quartzite (K21140)						-	may be a bi-face fragment
		Totals: **Prehistoric Material**	**1**								
Glass Bottles and Commercial Containers											
0415.G001	A - 01	Containers - Unidentifiable - molded	1	- body - glass - Colorless	undec.					- ...AR...\.. .D...	

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture		Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area A. West of Masons Creek													
ST #0189 (N00600/W01650)													
		Totals:	**Glass Bottles and Commercial Containers**	**1**									
		Totals:	**ST #0189 (N00600/W01650)**	**2**									
ST #0190 (N00600/W01700)													
Prehistoric Material													
0417.P001	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -		1	fragment - silicates (natural)	Red, Dark jasper (K21100)						-	
		Totals:	**Prehistoric Material**	**1**									
		Totals:	**ST #0190 (N00600/W01700)**	**1**									
ST #0197 (N00600/W02050)													
Household Ceramics													
0432.A001	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -		1	body -							-	
		Totals:	**Household Ceramics**	**1**									
		Totals:	**ST #0197 (N00600/W02050)**	**1**									
ST #0203 (N00600/W02350)													
Household Ceramics													
0442.A001	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -		1	body -							-	unglazed exterior
		Totals:	**Household Ceramics**	**1**									
		Totals:	**ST #0203 (N00600/W02350)**	**1**									
		Totals:	**Area A. West of Masons Creek**	**19**				**8.8**					

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area B. Floodplain and crossing of Mason												
ST #0171 (N00600/W00700)												
Construction and Waste Material												
0365.C000	B - 01	Unidentifiable - unidentifiable		1	fragment - Gray - slate (M23230)		3.9				-	slate?
0365.C000	B - 01	coal - quarried		1	fragment - - - coal (F16030)		0.7				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**2**			**4.6**					
		Totals:	**ST #0171 (N00600/W00700)**	**2**			**4.6**					
ST #0175 (N00600/W00950)												
Prehistoric Material												
0378.P001	A - 01	Tools-Uniface - scraper (PAB0000000) -		1	whole - stone Grey argillite (M23010)						-	
		Totals:	**Prehistoric Material**	**1**								
		Totals:	**ST #0175 (N00600/W00950)**	**1**								
ST #0176 (N00600/W01000)												
Household Ceramics												
0382.A001	A - 01	Unidentifiable - Gray stoneware - domestic with Albany slip - (071.10) -		1	body -						-	interior brown slip - gray exterior salt-glaze
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0382.C002	A - 01	Unidentifiable - sheet		2	fragment - - - fe (iron) (E15080)		2.7				-	Discarded in lab
0382.C000	A - 01	brick - unidentifiable		2	fragment - Orange - brick (J20010)		1.5				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**4.2**					
		Totals:	**ST #0176 (N00600/W01000)**	**5**			**4.2**					
		Totals:	**Area B. Floodplain and crossing of Mason Creek**	**8**			**8.8**					

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0001 (N00753/W00497)											
Prehistoric Material											
1004.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Red, Light chert (K21040)						-	weathered on one side
1000.P003	A - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - silicates (natural) Brown jasper (K21100)						-	worn
1009.P001	D - 01	Core - (PAI0000000) -	1	fragment - silicates (natural) White quartz (K21130)						-	possible biface
1008.P001	C - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	2	fragment - stone Grey argillite (M23010)						-	
1000.P002	A - 01	Tools-Biface - unidentifiable (PAA9900000) -	1	fragment - stone Grey argillite (M23010)						-	worn
1004.P001	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	some off-white veining
1000.P005	A - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) White quartz (K21130)						-	white with purplish streaking - may be non-cultural
1000.P004	A - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - stone grey argillite (M23010)						-	cortex fragment - yellowish brown - may be non-cultural
1004.P003	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	weathered
1004.P007	B - 01	Fire-cracked rock - (PAP0000000) -	1	fragment with cortex - stone Variegated sandstone (M23200)						-	exterior is fire reddened
1000.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	thin flake with translucent edges
1013.P001	D - 02	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
1004.P006	B - 01	Raw material - raw material (PAR0200000) -	1	fragment - stone Grey argillite (M23010)						-	tested cobble(?)
1008.P002	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Purple, Light quartzite (K21140)						-	may be a sandstone - pitted surface - small flake
1004.P004	B - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
1004.P005	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - stone Grey argillite (M23010)						-	one is less weathered
		Totals: **Prehistoric Material**	**18**								
Construction and Waste Material											

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0001 (N00753/W00497)											
Construction and Waste Material											
1004.C000	B - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	Discarded in lab
1004.C000	B - 01	coal - quarried	1	fragment - - - coal (F16030)		4.0				-	Discarded in lab
1000.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.9				-	Discarded in lab
1004.C003	B - 01	nail - hand wrought/forged	1	head and shank - - - fe (iron) (E15080)						-	
1004.C004	B - 01	nail - Wrought or Cut	1	shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**5**			**4.9**					
		Totals: **EU #0001 (N00753/W00497)**	**23**			**4.9**					
EU #0002 (N00753/W00472)											
Prehistoric Material											
1007.P002	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Red jasper (K21100)						-	
1007.P003	C - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	grayish green
1001.P004	A - 01	Unidentifiable - (PAZ0000000) -	1	fragment - stone Brown sandstone (M23200)						-	light brown - with cortex - may be non-cultural
1005.P005	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - stone Grey argillite (M23010)						-	weathered
1005.P001	B - 01	Tools-Biface - Projectile point-Archaic (PAA1000000) -	1	whole - stone Grey argillite (M23010)				1.5	0.6	-	
1012.P001	C - 02	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - stone Grey argillite (M23010)						-	
1001.P002	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - stone Grey argillite (M23010)						-	
1001.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
1007.P001	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
1001.P003	A - 01	Fire-cracked rock - (PAP0000000) -	1	fragment with cortex - stone Purple, Light sandstone (M23200)						-	exterior is slightly reddened
1007.P008	C - 01	Unidentifiable - (PAZ0000000) -	1	fragment - stone Grey conglomerate (M23041)						-	quartz conglomerate
1005.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	dark grey
1012.P002	C - 02	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone Grey argillite (M23010)						-	grayish green

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0002 (N00753/W00472)											
Prehistoric Material											
1005.P006	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey quartzite (K21140)						-	
1005.P003	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	brownish grey
1005.P007	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) Black unidentified (K21999)						-	glassy - possibly obsidian
1005.P004	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Red, Dark jasper (K21100)						-	
		Totals: **Prehistoric Material**	**19**								
Household Ceramics											
1005.A001	B - 01	Plate - Staffordshire slipware - (074.00) -	1	body -						-	unglazed exterior - no interior finish
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
1001.M001	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - plastic (N24090) Colorless	undecorated					-	thin, rigid plastic - modern - stained pale yellow - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
1001.C000	A - 01	brick - molded	1	fragment - Red - brick (J20010)		22.4				-	Discarded in lab
1005.C001	B - 01	coal - quarried	4	fragment - - - coal (F16030)		148.2				-	Discarded in lab
1001.C000	A - 01	coal - quarried	6	fragment - - - coal (F16030)		17.4				-	Discarded in lab
1001.C000	A - 01	brick - molded	3	fragment - Orange - brick (J20010)		0.9				-	Discarded in lab
1005.C002	B - 01	nail - hand wrought/forged	1	whole - - - fe (iron) (E15080)				2.4		-	may be a flooring nail
		Totals: **Construction and Waste Material**	**15**			**188.9**					
		Totals: **EU #0002 (N00753/W00472)**	**36**			**188.9**					
EU #0003 (N00753/W00447)											
Prehistoric Material											
1006.P003	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0003 (N00753/W00447)											
Prehistoric Material											
1006.P005	C - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone Grey argillite (M23010)						-	weathered
1010.P001	C - 02	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Grey quartzite (K21140)						-	quartz conglomerate
1003.P001	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	lighter cortex or weathering
1006.P004	C - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Variegated chert (K21040)						-	tan, gray, red veining
1003.P002	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) Black chert (K21040)						-	small amount of lighter streaking
1003.P004	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (K21130)						-	some red/pink veining
1006.P002	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Brown chert (K21040)						-	
1006.P006	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Purple, Light quartzite (K21140)						-	
1006.P007	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - silicates (natural) White quartz (K21130)						-	may be non-cultural
1002.P002	A - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) Red, Dark jasper (K21100)						-	with small amount of cortex
1006.P001	C - 01	Tools-Biface - unidentifiable (PAA9900000) -	1	whole - stone Grey argillite (M23010)						-	scraper or knife(?) - weathered
1003.P003	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) White quartz (K21130)						-	cloudy
1002.P001	A - 01	Tools-Biface - Projectile point-Archaic (PAA1000000) -	1	whole - stone Grey argillite (M23010)				1.4	0.6	-	
1003.P005	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) White quartz (K21130)						-	with cortex - burnt - may be non-cultural or FCR
1010.P002	C - 02	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - stone Grey argillite (M23010)						-	one is worn and eroded
1011.P001	D - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) White quartz (K21130)						-	appears to be water worn
		Totals: **Prehistoric Material**	**19**								
Household Ceramics											
1003.A002	B - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	1	body -						-	small sherd

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0003 (N00753/W00447)											
Household Ceramics											
1003.A003	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	dark red paste - glazed both sides
1003.A001	B - 01	Unidentifiable - Whiteware/Ironstone - stick-stamped-polychrome - (035.12) -	1	body -						-	exterior red and green dcoration
		Totals: **Household Ceramics**	**3**								
Miscellaneous Personal and Small Finds											
1003.M000	B - 01	Unidentifiable-- - - molded - -64th	1	fragment - plastic (N24090) Black	undecorated				0.2	-	thin, flat strip - discarded in lab
1002.M001	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - plastic (N24090) Black	undecorated				0.2	-	thin flat strip of plastic - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**2**								
Construction and Waste Material											
1002.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.3				-	Discarded in lab
1003.C000	B - 01	brick - molded	1	fragment w/ 1 dim. (height) - Red - brick (J20010)		440.7	2.3			-	
1003.C000	B - 01	coal - quarried	5	fragment - - - coal (F16030)		1.8				-	Discarded in lab
1003.C002	B - 01	brick - molded	1	fragment - Orange - brick (J20010)		1.4				-	Discarded in lab
1003.C004	B - 01	nail - Wrought or Cut	1	shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**9**			**444.2**					
		Totals: **EU #0003 (N00753/W00447)**	**33**			**444.2**					
EU #0004 (N00753/W00297)											
Prehistoric Material											
1017.P004	B - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Purple unidentifiable (M23999)						-	siltstone or argillite(?)
1017.P005	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - stone Grey argillite (M23010)						-	may be non-cultural
1017.P003	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Brown chert (K21040)						-	light brown/tan
1017.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	with gray cortex or lighter veining (?)

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0004 (N00753/W00297)											
Prehistoric Material											
1017.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
1022.P001	- - -	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Other jasper (K21100)						-	heat treated - with cortex and outer reddish band
1021.P001	D - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - stone Grey conglomerate (M23041)						-	quartz conglomerate - may be non-cultural
		Totals: **Prehistoric Material**	**7**								
Household Ceramics											
1017.A004	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	fragment -						-	glazed one side - no opposing surface
1021.A001	D - 01	Tea Cup - Porcelain - Chinese export - overglaze - polychrome - (051.20) -	1	rim -						-	overglaze red and other colors - worn
1017.A001	B - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	2	body -						-	
1017.A005	B - 01	Unidentified (sherd-level ident.) - Redware - (072.00) -	2	paste fragment -						-	unglazed exterior
1017.A003	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	3	body -						-	unglazed exterior
1017.A002	B - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -	1	base -						-	unglazed exterior
1017.A006	B - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	2	paste fragment -						-	
		Totals: **Household Ceramics**	**12**								
Miscellaneous Personal and Small Finds											
1017.M002	B - 01	Unidentifiable-- - - sheet - -64th	1	fragment - vinyl (N24110) Gray	patterned su					-	discarded in lab
1017.M001	B - 01	Unidentifiable-- - - plate - -64th	1	fragment - glass (J20060) Aqua	undecorated					-	may be bottle glass
1014.M001	A - 01	Unidentifiable-- - - sheet - -64th	1	fragment - vinyl (N24110) Green, Light	patterned su					-	thin sheet vinyl - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**3**								
Construction and Waste Material											

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0004 (N00753/W00297)											
Construction and Waste Material											
1017.C004	B - 01	nail - Wrought or Cut	1	shank - - - fe (iron) (E15080)						-	
1014.C000	A - 01	coal - quarried	4	fragment - - - coal (F16030)		4.6				-	Discarded in lab
1017.C000	B - 01	coal - quarried	46	fragment - - - coal (F16030)		45.5				-	Discarded in lab
1022.C001	- - -	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	
1017.C000	B - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	Discarded in lab
1017.C000	B - 01	brick - molded	42	fragment - Orange - brick (J20010)		50.1				-	Discarded in lab
1014.C000	A - 01	brick - molded	1	fragment - Orange - brick (J20010)		0.3				-	Discarded in lab
1014.C000	A - 01	brick - molded	8	fragment - Red - brick (J20010)		22.4				-	Discarded in lab
		Totals: **Construction and Waste Material**	**104**			**122.9**					
		Totals: **EU #0004 (N00753/W00297)**	**126**			**122.9**					
EU #0005 (N00753/W00272)											
Prehistoric Material											
1018.P005	B - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Purple unidentifiable (M23999)						-	argillite or silt stone?
1018.P003	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Variegated jasper (K21100)						-	tan with lt.gray veining
1018.P006	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey quartzite (K21140)						-	
1018.P004	B - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone Grey argillite (M23010)						-	weathered
1018.P007	B - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Grey unidentifiable (M23999)						-	
1018.P001	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Colorless quartz (K21130)						-	
1018.P008	B - 01	Fire-cracked rock - (PAP0000000) -	1	fragment - stone Brown conglomerate (M23041)						-	quartz conglomerate - fire reddened
1018.P002	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
1018.P009	B - 01	Hollowware - food storage-cooking (PBA0199000) -	1	body - silicates (natural) Brown other (K21990)						-	possible pottery sherd(?)
		Totals: **Prehistoric Material**	**9**								
Household Ceramics											

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
EU #0005 (N00753/W00272)											
Household Ceramics											
1015.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	glazed both sides
1018.A001	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	unglazed exterior
1018.A002	B - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**3**								
Miscellaneous Personal and Small Finds											
1018.M001	B - 01	Food Service - Drinkware (Glass) - - molded - -64th	1	base - glass (J20060) Colorless	exterior pane					-	mug or tumbler
1015.M001	A - 01	Bullet-22 caliber-short - - molded - -64th	1	whole - pb (lead) (E15140) -	-					-	slight corrosion
		Totals: **Miscellaneous Personal and Small Finds**	**2**								
Glass Bottles and Commercial Containers											
1018.G001	B - 01	Containers - Unidentifiable - molded	1	- body - glass - Aqua, Dark	undec.					-	curved
		Totals: **Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material											
1018.C004	B - 01	nail - unidentifiable	1	shank - - - fe (iron) (E15080)						-	may not be a nail
1015.C000	A - 01	brick - molded	6	fragment - Orange - brick (J20010)		13.8				-	Discarded in lab
1015.C000	A - 01	brick - molded	1	body - Red - brick (J20010)		2.7				-	Discarded in lab
1018.C000	B - 01	brick - molded	3	fragment - Red - brick (J20010)		72.6				-	Discarded in lab
1018.C000	B - 01	brick - molded	41	body - Orange - brick (J20010)		47.8				-	Discarded in lab
1015.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		5.9				-	Discarded in lab
1018.C000	B - 01	coal - quarried	29	fragment - - - coal (F16030)		27.5				-	Discarded in lab
1018.C005	B - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	
		Totals: **Construction and Waste Material**	**85**			**170.3**					
		Totals: **EU #0005 (N00753/W00272)**	**100**			**170.3**					
ST #0225 (N00675/W00400)											

Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek												
ST #0225 (N00675/W00400)												
Prehistoric Material												
0488.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural)	Grey chert (K21040)						-	dark grey
		Totals: **Prehistoric Material**	**1**									
		Totals: **ST #0225 (N00675/W00400)**	**1**									
ST #0234 (N00700/W00300)												
Prehistoric Material												
0500.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural)	Grey chert (K21040)						-	dark grey
		Totals: **Prehistoric Material**	**1**									
		Totals: **ST #0234 (N00700/W00300)**	**1**									
ST #0238 (N00700/W00400)												
Prehistoric Material												
0508.P001	A - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural)	Yellow jasper (K21100)						-	yellowish brown with grey veining and cortex
0508.P002	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone	Grey argillite (M23010)						-	dark grey
		Totals: **Prehistoric Material**	**2**									
		Totals: **ST #0238 (N00700/W00400)**	**2**									
ST #0239 (N00700/W00425)												
Prehistoric Material												
0511.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural)	Colorless quartz (K21130)						-	
		Totals: **Prehistoric Material**	**1**									
		Totals: **ST #0239 (N00700/W00425)**	**1**									
ST #0240 (N00700/W00450)												
Household Ceramics												
0512.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	rim -							-	glazed both sides
		Totals: **Household Ceramics**	**1**									

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
		Totals: **ST #0240 (N00700/W00450)**	**1**								
ST #0241 (N00700/W00475)											
Prehistoric Material											
0515.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	
		Totals: **Prehistoric Material**	**1**								
Household Ceramics											
0514.A001	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -	1	body -						-	glazed one side - no opposing surface - small sherd
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0514.C000	A - 01	brick - unidentifiable	2	fragment - Orange - brick (J20010)		2.4				-	Discarded in lab
		Totals: **Construction and Waste Material**	**2**			**2.4**					
		Totals: **ST #0241 (N00700/W00475)**	**4**			**2.4**					
ST #0242 (N00700/W00500)											
Prehistoric Material											
0516.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	
0516.P002	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Colorless quartz (K21130)						-	
0516.P003	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone Grey argillite (M23010)						-	weathered
		Totals: **Prehistoric Material**	**3**								
Construction and Waste Material											
0516.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.4				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.4**					
		Totals: **ST #0242 (N00700/W00500)**	**4**			**0.4**					
ST #0249 (N00725/W00250)											
Prehistoric Material											

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0249 (N00725/W00250)											
Prehistoric Material											
0531.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (pink) (K21120)						-	
0532.P002	B - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
0532.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - silicates (natural) Red jasper (K21100)						-	
		Totals: **Prehistoric Material**	**4**								
Construction and Waste Material											
0531.C000	A - 01	brick - unidentifiable	6	fragment - Red - brick (J20010)		15.7				-	Discarded in lab
0531.C000	A - 01	coal - quarried	4	fragment - - - coal (F16030)		0.8				-	Discarded in lab
		Totals: **Construction and Waste Material**	**10**			**16.5**					
		Totals: **ST #0249 (N00725/W00250)**	**14**			**16.5**					
ST #0251 (N00725/W00300)											
Prehistoric Material											
0535.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Colorless quartz (K21130)						-	
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0535.C000	A - 01	brick - unidentifiable	5	fragment - Orange - brick (J20010)		5.0				-	Discarded in lab
0535.C000	A - 01	brick - unidentifiable	1	fragment - Buff - brick (J20010)		8.7				-	glazed on one side - Discarded in lab
0535.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		1.3				-	Discarded in lab
		Totals: **Construction and Waste Material**	**8**			**15.0**					
		Totals: **ST #0251 (N00725/W00300)**	**9**			**15.0**					
ST #0252 (N00725/W00325)											
Household Ceramics											
0537.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -	1	fragment -						-	near rim
		Totals: **Household Ceramics**	**1**								

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
		Totals: **ST #0252 (N00725/W00325)**	**1**								
ST #0253 (N00725/W00375)											
Prehistoric Material											
0540.P001	B - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Colorless quartz (K21130)						-	
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0539.C000	A - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		2.8				-	Discarded in lab
0539.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		1.0				-	Discarded in lab
0539.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.3				-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**4.1**					
		Totals: **ST #0253 (N00725/W00375)**	**4**			**4.1**					
ST #0254 (N00725/W00400)											
Prehistoric Material											
0542.P001	B - 01	Core - (PAI0000000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
		Totals: **Prehistoric Material**	**1**								
Household Ceramics											
0542.A001	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**1**								
		Totals: **ST #0254 (N00725/W00400)**	**2**								
ST #0255 (N00725/W00425)											
Prehistoric Material											
0545.P003	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	
0545.P001	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	
0544.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	
0544.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Green, Dark chert (K21040)						-	

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0255 (N00725/W00425)											
Prehistoric Material											
0545.P002	C - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Black chert (K21040)						-	small flake with cortex
		Totals: **Prehistoric Material**	**5**								
		Totals: **ST #0255 (N00725/W00425)**	**5**								
ST #0256 (N00725/W00450)											
Prehistoric Material											
0546.P003	A - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
0546.P001	A - 01	Tools-Biface - Projectile point - unidentifiable (PAA2900000) -	1	tip fragment - stone Grey argillite (M23010)						-	triangular
0546.P002	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
0546.P004	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - silicates (natural) White quartz (K21130)						-	
		Totals: **Prehistoric Material**	**5**								
Household Ceramics											
0546.A001	A - 01	Unidentified (sherd-level ident.) - Yellowware - American-undecorated - (039.00) -	1	body -						-	small sherd
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0546.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		1.6				-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**1.6**					
		Totals: **ST #0256 (N00725/W00450)**	**9**			**1.6**					
ST #0257 (N00725/W00475)											
Prehistoric Material											
0549.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Colorless quartz (K21130)						-	
0549.P001	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Variegated chert (K21040)						-	with cortex - heat treated?
		Totals: **Prehistoric Material**	**2**								
Household Ceramics											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0257 (N00725/W00475)											
Household Ceramics											
0549.A001	B - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - stick-stamped-polychrome - (035.12) -	1	chip -						-	red and green exterior decoration
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0548.C002	A - 01	nail - machine cut with cut head	1	head and shank - - - fe (iron) (E15080)						-	
0548.C000	A - 01	nail - unidentifiable	1	shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**2**								
		Totals: **ST #0257 (N00725/W00475)**	**5**								
ST #0259 (N00725/W00500)											
Prehistoric Material											
0553.P003	B - 01	Fire-cracked rock - (PAP0000000) -	1	fragment with cortex - silicates (natural) Variegated quartz (K21130)						-	cortex is reddened
0553.P002	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - stone Grey argillite (M23010)						-	large flake - weathered
0553.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Black chert (K21040)						-	
		Totals: **Prehistoric Material**	**3**								
		Totals: **ST #0259 (N00725/W00500)**	**3**								
ST #0269 (N00750/W00250)											
Prehistoric Material											
0580.P001	B - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
0580.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - stone Grey argillite (M23010)						-	may be non-cultural
		Totals: **Prehistoric Material**	**2**								
Construction and Waste Material											
0580.C000	B - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		0.1				-	Discarded in lab
0580.C000	B - 01	coal - quarried	3	fragment - - - coal (F16030)		2.1				-	Discarded in lab

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0269 (N00750/W00250)											
		Totals: **Construction and Waste Material**	**4**			**2.2**					
		Totals: **ST #0269 (N00750/W00250)**	**6**			**2.2**					
ST #0270 (N00750/W00275)											
Prehistoric Material											
0582.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	yellowish brown with lighter veining
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0582.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.4				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.4**					
		Totals: **ST #0270 (N00750/W00275)**	**2**			**0.4**					
ST #0271 (N00750/W00300)											
Prehistoric Material											
0587.P001	C - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) White quartz (K21130)						-	possible point tip(?)
0586.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	dark yellowish brown
		Totals: **Prehistoric Material**	**2**								
Household Ceramics											
0586.A001	B - 01	Unidentifiable - Redware - (072.00) -	1	body -						-	unglazed exterior - no opposing surface
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0586.C000	B - 01	coal - quarried	5	fragment - - - coal (F16030)		2.6				-	Discarded in lab
0586.C000	B - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		0.7				-	Discarded in lab
		Totals: **Construction and Waste Material**	**6**			**3.3**					
		Totals: **ST #0271 (N00750/W00300)**	**9**			**3.3**					
ST #0274 (N00750/W00375)											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0274 (N00750/W00375)											
Prehistoric Material											
0592.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - stone Grey argillite (M23010)						-	may be non-cultural
		Totals: **Prehistoric Material**	**1**								
		Totals: **ST #0274 (N00750/W00375)**	**1**								
ST #0275 (N00750/W00400)											
Construction and Waste Material											
0594.C001	A - 01	nail - machine cut with cut head	1	whole - - - fe (iron) (E15080)				2.4		-	
		Totals: **Construction and Waste Material**	**1**								
		Totals: **ST #0275 (N00750/W00400)**	**1**								
ST #0276 (N00750/W00425)											
Prehistoric Material											
0598.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
0599.P001	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
0598.P002	B - 01	Unidentifiable - (PAZ0000000) -	1	fragment - silicates (natural) White quartzite (K21140)						-	appears to be quartzite - glazed surface? - may be non-cultural
		Totals: **Prehistoric Material**	**3**								
Glass Bottles and Commercial Containers											
0598.G001	B - 01	Containers - Unidentifiable - molded	1	- body - glass - Amber, Light	undecorated					-	
		Totals: **Glass Bottles and Commercial Containers**	**1**								
		Totals: **ST #0276 (N00750/W00425)**	**4**								
ST #0277 (N00750/W00450)											
Prehistoric Material											
0601.P002	B - 01	Unidentifiable - (PAZ0000000) -	1	fragment - stone Grey unidentifiable (M23999)						-	pitted surface - thin - elongated object - may be non-cultural

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0277 (N00750/W00450)											
Prehistoric Material											
0601.P001	B - 01	Tools-Biface - Projectile point - unidentifiable (PAA2900000) -	1	tip fragment - silicates (natural) Grey quartzite (K21140)						-	possible point tip fragment
0600.P001	A - 01	Unidentifiable - (PAZ0000000) -	2	fragment - silicates (natural) Grey quartzite (K21140)						-	may be fire cracked rock - appears to be a fresh break - non-cultural?
		Totals: **Prehistoric Material**	**4**								
Construction and Waste Material											
0600.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		0.3				-	Discarded in lab
0600.C003	A - 01	nail - hand wrought/forged	1	head and shank - - - fe (iron) (E15080)						-	
0600.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		9.9				-	Discarded in lab
0601.C000	B - 01	coal - quarried	1	fragment - - - coal (F16030)		0.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**5**			**10.4**					
		Totals: **ST #0277 (N00750/W00450)**	**9**			**10.4**					
ST #0278 (N00750/W00475)											
Prehistoric Material											
0602.P002	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - stone Grey slate (M23230)						-	may be non-cultural - question on material
0602.P001	A - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) White quartz (K21130)						-	
0602.P003	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - stone Grey argillite (M23010)						-	
		Totals: **Prehistoric Material**	**3**								
Construction and Waste Material											
0602.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.2**					
		Totals: **ST #0278 (N00750/W00475)**	**4**			**0.2**					
ST #0279 (N00750/W00500)											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0279 (N00750/W00500)											
Prehistoric Material											
0605.P001	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) White quartz (K21130)						-	with staining - mey be non-cultural
0604.P001	A - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Grey argillite (M23010)						-	weathered
		Totals: **Prehistoric Material**	**2**								
Construction and Waste Material											
0604.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.5				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.5**					
		Totals: **ST #0279 (N00750/W00500)**	**3**			**0.5**					
ST #0280 (N00750/W00525)											
Prehistoric Material											
0606.P001	A - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Red jasper (K21100)						-	cortex is lighter color
0606.P002	A - 01	Core Tool - (PAH0000000) -	1	whole - silicates (natural) White quartz (pink) (K21120)						-	rounded cobble (approximately 1.5-inch diameter) with flaked edge
0606.P003	A - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) White quartz (K21130)						-	may be non-cultural
		Totals: **Prehistoric Material**	**3**								
Construction and Waste Material											
0606.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.1				-	Discarded in lab
0606.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.1				-	Discarded in lab
		Totals: **Construction and Waste Material**	**2**			**0.2**					
		Totals: **ST #0280 (N00750/W00525)**	**5**			**0.2**					
ST #0281 (N00750/W00550)											
Prehistoric Material											
0609.P002	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	2	fragment - silicates (natural) White quartz (K21130)						-	

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. 28-Bu-62 - East of Masons Creek											
ST #0281 (N00750/W00550)											
Prehistoric Material											
0609.P001	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Brown jasper (K21100)						-	weathered
0610.P001	C - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	
		Totals: **Prehistoric Material**	**4**								
Household Ceramics											
0609.A001	B - 01	Plate - Redware - slipped-lead glaze-clear - (072.20) -	1	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0609.M000	B - 01	Unidentifiable-- - - sheet - -64th	1	fragment - vinyl (N24110) Blue	undecorated					-	small fragment <0.5 inch - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0609.C000	B - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		0.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.2**					
		Totals: **ST #0281 (N00750/W00550)**	**7**			**0.2**					
ST #0282 (N00750/W00575)											
Prehistoric Material											
0612.P002	B - 01	Waste flakes-unutilized - primary flake (PAL0100000) -	1	fragment - silicates (natural) Yellow jasper (K21100)						-	
0612.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Red jasper (K21100)						-	fire reddened
0612.P004	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	2	fragment - silicates (natural) White quartz (K21130)						-	with pink streaks
0612.P003	B - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	
		Totals: **Prehistoric Material**	**5**								
		Totals: **ST #0282 (N00750/W00575)**	**5**								

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Catnum	Stratum	Object - Manufacture		Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
		Totals:	**Area C. 28-Bu-62 - East of Masons Creek**	**440**				**988.6**					

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0157 (N00600/W00000)												
Construction and Waste Material												
0328.C000	A - 01	brick - unidentifiable		4	fragment - Red - brick (J20010)		3.4				-	Discarded in lab
0328.C000	A - 01	coal - quarried		2	fragment - - - coal (F16030)		1.0				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**6**			**4.4**					
		Totals:	**ST #0157 (N00600/W00000)**	**6**			**4.4**					
ST #0158 (N00600/W00050)												
Construction and Waste Material												
0330.C000	A - 01	coal - quarried		2	fragment - - - coal (F16030)		1.7				-	Discarded in lab
0330.C000	A - 01	brick - unidentifiable		5	fragment - Red - brick (J20010)		23.8				-	Discarded in lab
0330.C000	A - 01	coal - quarried		3	fragment - - - coal (F16030)		14.2				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**10**			**39.7**					
		Totals:	**ST #0158 (N00600/W00050)**	**10**			**39.7**					
ST #0159 (N00600/W00100)												
Construction and Waste Material												
0332.C000	A - 01	coal - quarried		27	fragment - Unidentifiable - coal (F16030)		21.6				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**27**			**21.6**					
		Totals:	**ST #0159 (N00600/W00100)**	**27**			**21.6**					
ST #0160 (N00600/W00150)												
Construction and Waste Material												
0334.C000	A - 01	coal - unidentifiable		2	fragment - - - coal (F16030)		1.3				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**2**			**1.3**					
		Totals:	**ST #0160 (N00600/W00150)**	**2**			**1.3**					
ST #0161 (N00600/W00200)												
Household Ceramics												
0336.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -		1	fragment -						-	very small sherd

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0161 (N00600/W00200)												
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0336.C000	A - 01	coal - quarried		5	fragment - - - coal (F16030)		1.9				-	Discarded in lab
0336.C000	A - 01	brick - unidentifiable		2	fragment - Orange - brick (J20010)		1.0				-	Discarded in lab
0336.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		2.6				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**8**			**5.5**					
		Totals:	**ST #0161 (N00600/W00200)**	**9**			**5.5**					
ST #0162 (N00600/W00250)												
Prehistoric Material												
0338.P001	A - 01	Waste flakes-unutilized - blocky fragment (PAL0400000) -		1	fragment - silicates (natural) White quartz (K21130)						-	
		Totals:	**Prehistoric Material**	**1**								
Construction and Waste Material												
0338.C000	A - 01	coal - quarried		3	fragment - - - coal (F16030)		1.0				-	Discarded in lab
0338.C000	A - 01	brick - unidentifiable		3	fragment - Orange - brick (J20010)		7.4				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**6**			**8.4**					
		Totals:	**ST #0162 (N00600/W00250)**	**7**			**8.4**					
ST #0163 (N00600/W00300)												
Household Ceramics												
0340.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -		1	body -						-	glazed one side - no opposing surface
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0341.C000	B - 01	coal - quarried		1	fragment - - - coal (F16030)		0.1				-	Discarded in lab
0341.C000	B - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		30.1				-	Discarded in lab
0340.C000	A - 01	brick - unidentifiable		4	fragment - Orange - brick (J20010)		6.2				-	Discarded in lab
0340.C000	A - 01	coal - quarried		2	fragment - - - coal (F16030)		3.0				-	Discarded in lab

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0163 (N00600/W00300)												
		Totals:	**Construction and Waste Material**	**8**			**39.4**					
		Totals:	**ST #0163 (N00600/W00300)**	**9**			**39.4**					
ST #0165 (N00600/W00400)												
Prehistoric Material												
0344.P001	A - 01	Tools-Uniface - scraper (PAB0000000) -		1	whole - silicates (natural) Grey quartzite (K21140)						-	
		Totals:	**Prehistoric Material**	**1**								
Construction and Waste Material												
0344.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		0.8				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**1**			**0.8**					
		Totals:	**ST #0165 (N00600/W00400)**	**2**			**0.8**					
ST #0168 (N00600/W00550)												
Prehistoric Material												
0353.P001	B - 01	Fire-cracked rock - (PAP0000000) -		1	fragment with cortex - stone Purple, Light conglomerate (M23041)						-	quartz conglomerate - with cortex
		Totals:	**Prehistoric Material**	**1**								
Construction and Waste Material												
0354.C000	C - 01	coal - quarried		1	fragment - - - coal (F16030)		0.4				-	Discarded in lab
0354.C000	C - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.4				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**2**			**0.8**					
		Totals:	**ST #0168 (N00600/W00550)**	**3**			**0.8**					
ST #0169 (N00600/W00600)												
Construction and Waste Material												
0358.C000	C - 01	brick - unidentifiable		10	fragment - Orange - brick (J20010)		35.9				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**10**			**35.9**					
		Totals:	**ST #0169 (N00600/W00600)**	**10**			**35.9**					
ST #0170 (N00600/W00650)												

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0170 (N00600/W00650)												
Miscellaneous Personal and Small Finds												
0360.M000	A - 01	Unidentifiable-- - - machine made - -64th		1	fragment - unidentified (H18999) Blue	undecorated					-	painted fabric - linoleum?
		Totals:	**Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material												
0360.C000	A - 01	coal - quarried		3	fragment - - - coal (F16030)		0.6				-	Discarded in lab
0362.C000	C - 01	coal - quarried		1	fragment - - - coal (F16030)		0.2				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**0.8**					
		Totals:	**ST #0170 (N00600/W00650)**	**5**			**0.8**					
ST #0205 (N00650/W00000)												
Household Ceramics												
0446.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -		1	body -						-	
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0447.C000	B - 01	glazing (window glass) - plate		2	fragment - Colorless - glass (J20060)		0.2				-	Discarded in lab
0446.C000	A - 01	glazing (window glass) - plate		2	fragment - Aqua - glass (J20060)		1.1				-	Discarded in lab
0447.C000	B - 01	brick - unidentifiable		1	fragment - Red - brick (J20010)		1.5				-	Discarded in lab
0446.C000	A - 01	brick - unidentifiable		1	fragment - Red - brick (J20010)		5.7				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**6**			**8.5**					
		Totals:	**ST #0205 (N00650/W00000)**	**7**			**8.5**					
ST #0206 (N00650/W00050)												
Construction and Waste Material												
0448.C000	A - 01	coal - quarried		4	fragment - - - coal (F16030)		7.1				-	Discarded in lab
0448.C000	A - 01	brick - unidentifiable		2	fragment - Orange - brick (J20010)		0.3				-	Discarded in lab
0448.C000	A - 01	brick - unidentifiable		1	fragment - Red - brick (J20010)		150.4				-	
		Totals:	**Construction and Waste Material**	**7**			**157.8**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek											
		Totals: **ST #0206 (N00650/W00050)**	**7**			**157.8**					
ST #0208 (N00650/W00150)											
Prehistoric Material											
0452.P001	A - 01	Tools-Uniface - scraper (PAB0000000) -	1	fragment - silicates (natural) White quartz (K21130)						-	cortex on one side - may be a biface tool
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0452.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		17.2				-	Discarded in lab
0452.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		1.9				-	Discarded in lab
0452.C000	A - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		2.8				-	Discarded in lab
		Totals: **Construction and Waste Material**	**5**			**21.9**					
		Totals: **ST #0208 (N00650/W00150)**	**6**			**21.9**					
ST #0216 (N00650/W00550)											
Prehistoric Material											
0468.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Grey chert (K21040)						-	dark grey
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0468.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.8				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.8**					
		Totals: **ST #0216 (N00650/W00550)**	**2**			**0.8**					
ST #0217 (N00650/W00600)											
Household Ceramics											
0471.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	unglazed exterior
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0471.M000	A - 01	Unidentifiable-- - - sheet - -64th	1	fragment - synthetic (D14100) Blue, Light	painted on o				1.0	-	painted or vinyl covering on one side - fiberglass

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek											
ST #0217 (N00650/W00600)											
Miscellaneous Personal and Small Finds											
0471.M006	A - 01	metal fragment-iron-wire - - drawn - -64th	1	fragment - fe (iron) (E15080) -	-					-	heavily rusted
0471.M005	A - 01	metal fragment-iron- - - sheet - -64th	1	fragment - fe (iron) (E15080) -	undecorated			3.9	0.9	-	rectangular flat strip with 0.25-inch circular hole in beveled end
0471.M002	A - 01	Generic lamp part-lightbulb-incandescent - - - molded - -64th	1	body - glass (J20060) Colorless	undecorated					-	thin - with frosted interior surface
0471.M003	A - 01	Generic lamp part-lightbulb-incandescent - - - molded - -64th	54	body - glass (J20060) Colorless	undecorated					-	
0471.M000	A - 01	Unidentifiable-- - - molded - -64th	4	fragment - plastic (N24090) Tan	undecorated					-	1 with molded ridges on one side - 2 flat - 1 rim with molded edge - discarded in lab
0471.M000	A - 01	Unidentifiable-- - - sheet - -64th	2	fragment - linoleum (N24070) Other	undecorated					-	1 green - 1 gray with black (tar?) strips on one side - discarded in lab
0471.M004	A - 01	Unidentifiable-- - - molded - -64th	3	fragment - glass (J20060) Colorless	patterned ex					-	only one is decorated - 1 small chip - may be bottle glass
0471.M007	A - 01	Unidentifiable-- - - sheet - -64th	1	whole - aluminum (E15010) -	undecorated				2.9	-	flat disk with two small holes along the edge - appears to have been painted on one side
0471.M000	A - 01	Unidentifiable-- - - sheet - -64th	6	fragment - plastic (N24090) Other	undecorated					-	a variety of colors: dark and light green - colorless - and a variety of shapes - discarded in lab
0471.M000	A - 01	Unidentifiable-- - - sheet - -64th	1	fragment - aluminum foil (E15020) -	undecorated					-	small crumbpled fragment - wrapper? - discarded in lab

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek											
ST #0217 (N00650/W00600)											
Miscellaneous Personal and Small Finds											
0471.M000	A - 01	Unidentifiable-- - - molded - -64th	5	fragment - polystyrene (N24130) White	undecorated					-	may be commercial container fragments - discarded in lab
0471.M001	A - 01	Wrench-Flat-single-sided - - sheet - -64th	1	whole - fe (iron) (E15080) -	undecorated			6.4	0.9	-	width of handle - rusted - 7/8-inch wide open end
		Totals: **Miscellaneous Personal and Small Finds**	**81**								
Construction and Waste Material											
0471.C003	A - 01	nail - wire cut	1	whole - - - fe (iron) (E15080)				2.5		-	
0471.C002	A - 01	nail - wire cut	1	whole - - - fe (iron) (E15080)				1.5		-	
0471.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.5				-	Discarded in lab
0472.C000	B - 01	glazing (window glass) - plate	48	fragment - Aqua, Light - glass (J20060)		73.0				-	Discarded in lab
0471.C004	A - 01	nail - wire cut	1	whole - - - fe (iron) (E15080)				2.4		-	
0471.C000	A - 01	shingles - sheet	8	fragment - Black - tar paper (H18011)		3.0				-	discarded in lab
0471.C005	A - 01	nail - wire cut	2	whole - - - fe (iron) (E15080)				2.0		-	
0471.C008	A - 01	nail - Wrought or Cut	2	head and shank - - - fe (iron) (E15080)						-	
0471.C007	A - 01	nail - wire cut	8	shank - - - fe (iron) (E15080)						-	
0471.C006	A - 01	nail - wire cut	2	head and shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**74**			**76.5**					
		Totals: **ST #0217 (N00650/W00600)**	**156**			**76.5**					
ST #0218 (N00650/W00650)											
Household Ceramics											
0475.A001	B - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -	1	body -						-	small sherd
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0218 (N00650/W00650)												
Construction and Waste Material												
0474.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		1.5				-	Discarded in lab
0474.C000	A - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		4.3				-	Discarded in lab
0474.C000	A - 01	glazing (window glass) - plate		1	fragment - Colorless - glass (J20060)		3.2				-	Discarded in lab
0475.C000	B - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		8.3				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**17.3**					
		Totals:	**ST #0218 (N00650/W00650)**	**5**			**17.3**					
ST #0229 (N00700/W00100)												
Construction and Waste Material												
0494.C000	A - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.6				-	Discarded in lab
0494.C000	A - 01	coal - quarried		3	fragment - - - coal (F16030)		1.5				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**2.1**					
		Totals:	**ST #0229 (N00700/W00100)**	**4**			**2.1**					
ST #0231 (N00700/W00200)												
Construction and Waste Material												
0496.C000	A - 01	coal - quarried		16	fragment - - - coal (F16030)		30.0				-	Discarded in lab
0496.C000	A - 01	coal - quarried		4	fragment - - - coal (F16030)		6.9				-	Discarded in lab
0496.C000	A - 01	brick - unidentifiable		3	fragment - Red - brick (J20010)		1.8				-	Discarded in lab
0496.C000	A - 01	brick - unidentifiable		5	fragment - Orange - brick (J20010)		3.8				-	Discarded in lab
0496.C000	A - 01	mortar - ground and mixed		2	fragment - White - mortar (P26050)		0.4				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**30**			**42.9**					
		Totals:	**ST #0231 (N00700/W00200)**	**30**			**42.9**					
ST #0232 (N00700/W00250)												
Household Ceramics												
0497.A001	A - 01	Unidentifiable - Redware - slipped-lead/mang. glaze- olive brown - (072.17) -		1	body -						-	small sherd - may not be slipped
		Totals:	**Household Ceramics**	**1**								

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Catnum	Stratum	Object - Manufacture			Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek													
ST #0232 (N00700/W00250)													
Construction and Waste Material													
0497.C000	A - 01	coal - quarried			1	fragment - - - coal (F16030)		0.2				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**1**			**0.2**					
			Totals:	**ST #0232 (N00700/W00250)**	**2**			**0.2**					
ST #0233 (N00700/W00275)													
Household Ceramics													
0498.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -			1	body -						-	glazed both sides
			Totals:	**Household Ceramics**	**1**								
Construction and Waste Material													
0498.C000	A - 01	brick - unidentifiable			3	fragment - Orange - brick (J20010)		1.9				-	Discarded in lab
0498.C000	A - 01	coal - quarried			2	fragment - Unidentifiable - coal (F16030)		1.5				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**5**			**3.4**					
			Totals:	**ST #0233 (N00700/W00275)**	**6**			**3.4**					
ST #0243 (N00700/W00525)													
Construction and Waste Material													
0518.C000	A - 01	coal - quarried			1	fragment - Unidentifiable - coal (F16030)		0.9				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**1**			**0.9**					
			Totals:	**ST #0243 (N00700/W00525)**	**1**			**0.9**					
ST #0246 (N00700/W00650)													
Miscellaneous Personal and Small Finds													
0524.M002	A - 01	Unidentifiable-- - - plate - -64th			1	fragment - glass (J20060) Colorless	impressed sı					-	may be safety glass
0524.M003	A - 01	Unidentifiable-- - - molded - -64th			1	fragment - plastic (N24090) Colorless	impressed di					-	appears to be modern
0524.M004	A - 01	Unidentifiable-- - - molded - -64th			2	fragment - plastic (N24090) Colorless	undecorated					-	rigid plastic - curved in two directions

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek											
ST #0246 (N00700/W00650)											
Miscellaneous Personal and Small Finds											
0524.M005	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - polystyrene (N24130) White	undecorated					-	may be a commercial container - discarded in lab
0524.M006	A - 01	Unidentifiable-- - - sheet - -64th	1	fragment - asbestos (M23020) Gray	undecorated					-	thin sheet - discarded in lab
0524.M007	A - 01	Unidentifiable-- - - sheet - -64th	1	fragment - aluminum foil (E15020) Other	undecorated					-	crumpled - may be a food wrapper - discarded in lab
0524.M001	A - 01	Unidentifiable-- - - plate - -64th	1	fragment - glass (J20060) Colorless	undecorated					-	thick plate glass - with straight edge - cut?
0524.M008	A - 01	Unidentifiable-- - - stamped - -64th	1	whole - pb alloy (lead) (E15150) -	undecorated				0.3	-	thin, small object - discarded in lab
0524.M009	A - 01	Unidentifiable-- - - multiple processes - -64th	1	fragment - metal & non-metal (C13270) -	undecorated					-	rusted iron and unidentifiable material - possibly paint or tar - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**10**								
Construction and Waste Material											
0524.C000	A - 01	glazing (window glass) - plate	3	fragment - Aqua - glass (J20060)		3.8				-	Discarded in lab
0524.C002	A - 01	nail - wire cut	1	whole - - - fe (iron) (E15080)				1.9		-	
0524.C003	A - 01	nail - machine cut	1	shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**5**			**3.8**					
		Totals: **ST #0246 (N00700/W00650)**	**15**			**3.8**					
ST #0266 (N00750/W00150)											
Household Ceramics											
0571.A001	B - 01	Unidentifiable - Redware - (072.00) -	1	body -						-	unglazed exterior - worn interior - may be flowerpot?
		Totals: **Household Ceramics**	**1**								

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area C. East of Masons Creek												
ST #0266 (N00750/W00150)												
Construction and Waste Material												
0571.C000	B - 01	coal - quarried		1	fragment - - - coal (F16030)		0.3				-	Discarded in lab
0571.C000	B - 01	brick - unidentifiable		2	fragment - Orange - brick (J20010)		0.7				-	Discarded in lab
0571.C000	B - 01	coal - quarried		8	fragment - - - coal (F16030)		11.3				-	
		Totals:	**Construction and Waste Material**	**11**			**12.3**					
		Totals:	**ST #0266 (N00750/W00150)**	**12**			**12.3**					
ST #0268 (N00750/W00225)												
Construction and Waste Material												
0577.C000	B - 01	coal - quarried		1	fragment - Unidentifiable - coal (F16030)		0.2				-	Discarded in lab
0577.C000	B - 01	brick - unidentifiable		1	fragment w/ 1 dim. (height) - Red, Dark - brick (J20010)		85.0	2.1			-	glazed on three side - Discarded in lab
0577.C000	B - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.2				-	Discarded in lab
0577.C000	B - 01	coal - quarried		5	fragment - Unidentifiable - coal (F16030)		4.4				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**8**			**89.8**					
		Totals:	**ST #0268 (N00750/W00225)**	**8**			**89.8**					
		Totals:	**Area C. East of Masons Creek**	**351**			**596.8**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0006 (N00150/W00000)											
Prehistoric Material											
0015.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) White quartz (K21130)						-	tiny flake
		Totals: **Prehistoric Material**	**1**								
Miscellaneous Personal and Small Finds											
0015.M000	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - polystyrene (N24130) White	undecorated					-	small fragment - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0015.C000	A - 01	brick - unidentifiable	1	body - Red - brick (J20010)		1.8				-	dil
0015.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		0.8				-	dil
		Totals: **Construction and Waste Material**	**3**			**2.6**					
		Totals: **ST #0006 (N00150/W00000)**	**5**			**2.6**					
ST #0007 (N00150/W00050)											
Household Ceramics											
0017.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	unglazed exterior
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0017.C000	A - 01	asphalt - ground and mixed	1	fragment - - - asphalt (H18020)		17.8				-	dil
0017.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)		0.3				-	dil
		Totals: **Construction and Waste Material**	**2**			**18.1**					
		Totals: **ST #0007 (N00150/W00050)**	**3**			**18.1**					
ST #0011 (N00200/W00050)											
Prehistoric Material											
0026.P001	A - 01	Waste flakes-unutilized - secondary flake (PAL0200000) -	1	fragment - silicates (natural) Brown chert (K21040)						-	dark brown - may be jasper?
		Totals: **Prehistoric Material**	**1**								

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0011 (N00200/W00050)												
Construction and Waste Material												
0026.C000	A - 01	brick - unidentifiable		2	fragment - Red - brick (J20010)		0.4				-	dil
		Totals:	**Construction and Waste Material**	**2**			**0.4**					
		Totals:	**ST #0011 (N00200/W00050)**	**3**			**0.4**					
ST #0012 (N00200/W00075)												
Construction and Waste Material												
0028.C000	A - 01	asphalt - ground and mixed		1	fragment - - - asphalt (H18020)		7.5				-	dil
0028.C000	A - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.2				-	dil
0028.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		0.3				-	dil
		Totals:	**Construction and Waste Material**	**3**			**8.0**					
		Totals:	**ST #0012 (N00200/W00075)**	**3**			**8.0**					
ST #0014 (N00200/W00150)												
Household Ceramics												
0032.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -		2	body -						-	
		Totals:	**Household Ceramics**	**2**								
		Totals:	**ST #0014 (N00200/W00150)**	**2**								
ST #0016 (N00200/W00250)												
Miscellaneous Personal and Small Finds												
0036.M001	A - 01	metal fragment-iron-wire - - drawn - -64th		3	fragment - fe (iron) (E15080) -	-					-	rusted
		Totals:	**Miscellaneous Personal and Small Finds**	**3**								
Construction and Waste Material												
0036.C000	A - 01	brick - unidentifiable		1	body - Orange - brick (J20010)		0.3				-	dil
0036.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		0.2				-	dil
		Totals:	**Construction and Waste Material**	**2**			**0.5**					
		Totals:	**ST #0016 (N00200/W00250)**	**5**			**0.5**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0019 (N00200/W00400)											
Household Ceramics											
0044.A001	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -	1	body -						-	small sherd
0045.A001	B - 01	Unidentifiable - Redware - (072.00) -	1	body -						-	unglazed one side - no opposing surface
0044.A002	A - 01	Unidentifiable - Gray stoneware - (lt.gray/salmon body)-undecorated - (071.50) -	1	body -						-	brown salt-glazed ext. - no opposing surface
		Totals: **Household Ceramics**	**3**								
Miscellaneous Personal and Small Finds											
0044.M000	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - plastic (N24090) Colorless	undecorated					-	narrow strip with ridges on one side - cable tie fragment?
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0045.C000	B - 01	brick - unidentifiable	1	body - Red - brick (J20010)		0.5				-	dil
		Totals: **Construction and Waste Material**	**1**			**0.5**					
		Totals: **ST #0019 (N00200/W00400)**	**5**			**0.5**					
ST #0021 (N00200/W00500)											
Household Ceramics											
0050.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	body -						-	light red - unglazed exterior?
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0050.M002	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - rubber (N24100) Black	undecorated					-	may be a tire fragment
0050.M001	A - 01	Unidentifiable-- - - molded - -64th	1	body - glass (J20060) Other	raised circula					-	light yellowish
		Totals: **Miscellaneous Personal and Small Finds**	**2**								
		Totals: **ST #0021 (N00200/W00500)**	**3**								

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0024 (N00200/W00600)											
Household Ceramics											
0061.A001	B - 01	Unidentified - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed exterior - unglazed interior
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0061.C000	B - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.3				-	dil
		Totals: **Construction and Waste Material**	**1**			**0.3**					
		Totals: **ST #0024 (N00200/W00600)**	**2**			**0.3**					
ST #0025 (N00225/W00600)											
Miscellaneous Personal and Small Finds											
0063.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	6	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	at least two objects - one undecorated
		Totals: **Miscellaneous Personal and Small Finds**	**6**								
Construction and Waste Material											
0063.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.3				-	dil
0065.C000	C - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.3				-	dil
		Totals: **Construction and Waste Material**	**2**			**0.6**					
		Totals: **ST #0025 (N00225/W00600)**	**8**			**0.6**					
ST #0026 (N00250/W00000)											
Construction and Waste Material											
0067.C001	A - 01	drain pipe - molded	4	fragment - White - vinyl (N24110)						-	PVC pipe fragments - discarded in lab
		Totals: **Construction and Waste Material**	**4**								
		Totals: **ST #0026 (N00250/W00000)**	**4**								
ST #0029 (N00250/W00150)											
Household Ceramics											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0029 (N00250/W00150)												
Household Ceramics												
0073.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -							-	glazed both sides - burnt
		Totals: **Household Ceramics**	**1**									
Miscellaneous Personal and Small Finds												
0073.M001	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - glass (J20060)	Aqua	undecorated					-	partially melted? - may be bottle glass
		Totals: **Miscellaneous Personal and Small Finds**	**1**									
		Totals: **ST #0029 (N00250/W00150)**	**2**									
ST #0030 (N00250/W00200)												
Prehistoric Material												
0075.P001	A - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Other schist (M23220)							-	mica schist - mottle gray-black - may be non-cultural
		Totals: **Prehistoric Material**	**1**									
Construction and Waste Material												
0075.C000	A - 01	brick - unidentifiable	2	body -	Orange - brick (J20010)		1.4				-	dil - one is a dark orange
0075.C000	A - 01	brick - unidentifiable	1	body -	Red, Dark - brick (J20010)		5.7				-	surface has a gray glaze - dil
0075.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)			0.7				-	dil
		Totals: **Construction and Waste Material**	**4**				**7.8**					
		Totals: **ST #0030 (N00250/W00200)**	**5**				**7.8**					
ST #0031 (N00250/W00250)												
Household Ceramics												
0077.A003	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -	1	body -							-	glazed one side - no opposing surface
0077.A002	A - 01	Plate - Redware - slipped-lead glaze-clear - (072.20) -	5	body -							-	unglazed exterior - 4 join = 2 sherds

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0031 (N00250/W00250)											
Household Ceramics											
0077.A001	A - 01	Plate - Redware - coggle edge & slipped-lead-clear - (072.50) -	1	rim -						-	unglazed exterior
0077.A006	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
0077.A005	A - 01	Unidentifiable - Redware - (072.00) -	2	body -						-	unglazed exterior
0077.A004	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	glazed one side - no opposing surface - small sherd
		Totals: **Household Ceramics**	**11**								
Construction and Waste Material											
0077.C000	A - 01	brick - unidentifiable	2	body - Orange - brick (J20010)		1.6				-	dil
		Totals: **Construction and Waste Material**	**2**			**1.6**					
		Totals: **ST #0031 (N00250/W00250)**	**13**			**1.6**					
ST #0032 (N00250/W00200)											
Household Ceramics											
0079.A002	A - 01	Unidentifiable - Redware - (072.00) -	1	body -						-	unglazed exterior - no interior surface
0079.A001	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -	1	body -						-	glazed one side - no exterior surface
		Totals: **Household Ceramics**	**2**								
Construction and Waste Material											
0079.C000	A - 01	coal - quarried	5	fragment - - - coal (F16030)		3.0				-	dil
0079.C000	A - 01	brick - unidentifiable	2	body - Orange - brick (J20010)		4.7				-	dil
		Totals: **Construction and Waste Material**	**7**			**7.7**					
		Totals: **ST #0032 (N00250/W00200)**	**9**			**7.7**					
ST #0033 (N00250/W00350)											
Household Ceramics											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0033 (N00250/W00350)											
Household Ceramics											
0081.A001	A - 01	Unidentified (sherd-level ident.) - Creamware - undecorated - (007.00) -	1	body -						-	very light
0081.A003	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	small sherd - glazed one side - no opposing surface
0081.A002	A - 01	Unidentified (sherd-level ident.) - Pearlware - undecorated - (014.00) -	1	body -						-	
		Totals: **Household Ceramics**	**3**								
Construction and Waste Material											
0081.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.5				-	dil
0081.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		3.4				-	dil
		Totals: **Construction and Waste Material**	**4**			**3.9**					
		Totals: **ST #0033 (N00250/W00350)**	**7**			**3.9**					
ST #0034 (N00250/W00400)											
Miscellaneous Personal and Small Finds											
0083.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	4	rim and body - silt & pitch (skeet) (H18040) Black	yellow paint					-	2 join - 2 with dimples and yellow exterior
		Totals: **Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material											
0083.C000	A - 01	brick - unidentifiable	12	body - Orange - brick (J20010)		49.0				-	dil
0083.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		2.9				-	dil
0083.C000	A - 01	glazing (window glass) - plate	2	fragment - Aqua - glass (J20060)		0.8				-	dil
		Totals: **Construction and Waste Material**	**16**			**52.7**					
		Totals: **ST #0034 (N00250/W00400)**	**20**			**52.7**					
ST #0035 (N00250/W00425)											
Miscellaneous Personal and Small Finds											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0035 (N00250/W00425)											
Miscellaneous Personal and Small Finds											
0085.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	3	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	1 with red paint and molding on exterior
		Totals: **Miscellaneous Personal and Small Finds**	**3**								
		Totals: **ST #0035 (N00250/W00425)**	**3**								
ST #0036 (N00250/W00450)											
Prehistoric Material											
0088.P001	B - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -	1	fragment - silicates (natural) Brown chert (K21040)						-	grayish brown
		Totals: **Prehistoric Material**	**1**								
Construction and Waste Material											
0088.C000	B - 01	coal - quarried	1	fragment - - - coal (F16030)		0.2				-	dil
0088.C000	B - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.3				-	dil
		Totals: **Construction and Waste Material**	**2**			**0.5**					
		Totals: **ST #0036 (N00250/W00450)**	**3**			**0.5**					
ST #0037 (N00250/W00275)											
Household Ceramics											
0090.A001	A - 01	- - Redware - slipped-lead/mang. glaze-brown w. green colorant - (072.16) -	1	body -						-	unglazed exterior
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0090.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	5	rim and body - silt & pitch (skeet) (H18040) Black	yellow paint					-	3 with yellow paint on one side
		Totals: **Miscellaneous Personal and Small Finds**	**5**								
		Totals: **ST #0037 (N00250/W00275)**	**6**								
ST #0038 (N00250/W00500)											
Miscellaneous Personal and Small Finds											

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0038 (N00250/W00500)											
Miscellaneous Personal and Small Finds											
0091.M001	A - 01	Clay Pigeon-standard- - - handmade - -64th	12	rim and body - silt & pitch (skeet) (H18040) Black	painted - red					-	more than 1 object - 4 with yellow painted surface - 4 with red painted surface
		Totals: **Miscellaneous Personal and Small Finds**	**12**								
Construction and Waste Material											
0091.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.3				-	Discarded in lab
0091.C000	A - 01	brick - unidentifiable	5	body - Orange - brick (J20010)		4.3				-	Discarded in lab
		Totals: **Construction and Waste Material**	**6**			**4.6**					
		Totals: **ST #0038 (N00250/W00500)**	**18**			**4.6**					
ST #0039 (N00250/W00550)											
Miscellaneous Personal and Small Finds											
0094.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	3	rim and body - silt & pitch (skeet) (H18040) Black	painted - red					-	2 with yellow dimpled surface - 1 with red dimples
0094.M002	A - 01	Shot Gun Shell-unidentifiable size- - - molded - -64th	2	base - plastic (N24090) Colorless	undecorated					-	plastic shotgun shell casing?
		Totals: **Miscellaneous Personal and Small Finds**	**5**								
		Totals: **ST #0039 (N00250/W00550)**	**5**								
ST #0040 (N00250/W00600)											
Household Ceramics											
0099.A001	C - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed both sides
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0097.M002	A - 01	Unidentifiable-- - - molded - -64th	1	fragment - plastic (N24090) White	undecorated					-	flexible - may be a container cover - discarded in lab

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0040 (N00250/W00600)												
Miscellaneous Personal and Small Finds												
0097.M001	A - 01	Clay Pigeon-standard- - - molded - -64th		1	body - silt & pitch (skeet) (H18040) Black	red painted					-	red dimple on one side
		Totals:	**Miscellaneous Personal and Small Finds**	**2**								
		Totals:	**ST #0040 (N00250/W00600)**	**3**								
ST #0041 (N00275/W00600)												
Household Ceramics												
0101.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -		1	body -						-	glazed one side - no opposing surface
		Totals:	**Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds												
0101.M001	A - 01	Clay Pigeon-standard- - - molded - -64th		4	body - silt & pitch (skeet) (H18040) Black	red painted					-	painted on one side
		Totals:	**Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material												
0101.C000	A - 01	brick - unidentifiable		2	body - Orange - brick (J20010)		11.9				-	Discarded in lab
0101.C000	A - 01	coal - quarried		2	fragment - - - coal (F16030)		0.6				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**12.5**					
		Totals:	**ST #0041 (N00275/W00600)**	**9**			**12.5**					
ST #0042 (N00300/W00000)												
Household Ceramics												
0104.A001	B - 01	Unidentifiable - Rockingham ware - molded or embossed - (057.10) -		1	body -	molded or er					-	
		Totals:	**Household Ceramics**	**1**								
Glass Bottles and Commercial Containers												
0104.G001	B - 01	Containers - Alcoholic beverages - blown		1	- body - glass - Olive Green	undecorated					-	slight curve to body
		Totals:	**Glass Bottles and Commercial Containers**	**1**								

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0042 (N00300/W00000)												
Construction and Waste Material												
0104.C000	B - 01	brick - unidentifiable		2	body - Orange - brick (J20010)		0.9				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**2**			**0.9**					
		Totals:	**ST #0042 (N00300/W00000)**	**4**			**0.9**					
ST #0044 (N00300/W00100)												
Household Ceramics												
0108.A001	A - 01	Unidentifiable - Redware - (072.00) -		1	body -						-	unglazed exterior - no opposing surface
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0108.C000	A - 01	brick - unidentifiable		2	body - Orange - brick (J20010)		2.5				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**2**			**2.5**					
		Totals:	**ST #0044 (N00300/W00100)**	**3**			**2.5**					
ST #0045 (N00300/W00150)												
Household Ceramics												
0110.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -		1	body -						-	unglazed exterior
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0110.C000	A - 01	brick - unidentifiable		2	body - Orange - brick (J20010)		4.5				-	Discarded in lab - dark orange
		Totals:	**Construction and Waste Material**	**2**			**4.5**					
		Totals:	**ST #0045 (N00300/W00150)**	**3**			**4.5**					
ST #0047 (N00300/W00250)												
Household Ceramics												
0114.A005	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -		2	body -						-	join - glazed one side - no opposing surface

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0047 (N00300/W00250)											
Household Ceramics											
0114.A002	A - 01	Unidentified (sherd-level ident.) - Pearlware - undecorated - (014.00) -	1	body -						-	
0114.A003	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	1	body -						-	
0115.A001	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed one side - no opposing surface
0114.A004	A - 01	Unidentified (sherd-level ident.) - Redware - slipped-lead/mang. glaze-brown - (072.21) -	1	body -						-	unglazed exterior
0114.A006	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	2	paste fragment -						-	
0114.A001	A - 01	Unidentified (sherd-level ident.) - Creamware - undecorated - (007.00) -	1	body -						-	
		Totals: **Household Ceramics**	**9**								
Miscellaneous Personal and Small Finds											
0114.M001	A - 01	Fasteners-Cuff Links-- - - stamped - -64th	1	whole face missing shank - cu alloy (E15060) -	Masonic sym			0.6		-	missing braised shnk
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0114.C000	A - 01	brick - unidentifiable	3	body - Red - brick (J20010)		1.8				-	Discarded in lab
0114.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		1.5				-	Discarded in lab
0114.C000	A - 01	brick - unidentifiable	7	body - Orange - brick (J20010)		7.5				-	Discarded in lab - 4 frgaments are dark orange
		Totals: **Construction and Waste Material**	**13**			**10.8**					
		Totals: **ST #0047 (N00300/W00250)**	**23**			**10.8**					
ST #0048 (N00300/W00300)											
Household Ceramics											
0117.A001	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0048 (N00300/W00300)											
Miscellaneous Personal and Small Finds											
0116.M001	A - 01	Food Service - Tableware (non-glass) - - molded - -64th	1	Rim - glass (J20060) Colorless	unidentifiable					-	exterior decoration - int. beveled rim profile
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0117.C000	B - 01	brick - unidentifiable	1	body - Red - brick (J20010)		1.0				-	Discarded in lab
0117.C000	B - 01	brick - unidentifiable	2	body - Orange - brick (J20010)		0.5				-	Discarded in lab
0116.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.3				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**1.8**					
		Totals: **ST #0048 (N00300/W00300)**	**6**			**1.8**					
ST #0049 (N00300/W00350)											
Household Ceramics											
0120.A019	B - 01	Unidentifiable - Earthenware - paste fragment-white bodied - (099.10) -	2	paste fragment -						-	
0120.A016	B - 01	Unidentified (sherd-level ident.) - Pearlware - hand painted brown - (019.02) -	1	body -						-	all join - fresh breaks - small amount of decoration
0120.A011	B - 01	Unidentifiable - Redware - (072.00) -	5	body -						-	unglazed exterior - no opposing surface
0119.A008	A - 01	Unidentifiable - Redware - (072.00) -	2	body -						-	unglazed exterior - no opposing surface
0120.A005	B - 01	Unidentified (sherd-level ident.) - Redware - slipped-lead/mang. glaze-brown - (072.21) -	1	body -						-	unglazed exterior - thick bodied
0119.A004	A - 01	Unidentifiable - Refined redware - engined turned - (073.10) -	1	glaze chip -						-	small sherd
0120.A017	B - 01	Unidentified (sherd-level ident.) - Pearlware - undecorated - (014.00) -	4	body -						-	
0121.A001	C - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
0119.A001	A - 01	Unidentifiable - Whiteware/Ironstone - printed-lt. blue - (024.30) -	1	body -						-	

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Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0049 (N00300/W00350)												
Household Ceramics												
0119.A003	A - 01	Unidentifiable - Gray stoneware - domestic - (071.00) -	1	body -							-	ext. gray salt-glaze - interior brown slip - Albany(?) - undecorated
0120.A013	B - 01	Unidentifiable - Pearlware - annular designs - (015.00) -	1	body -							-	exterior blue bands
0120.A014	B - 01	Unidentifiable - Pearlware - hand painted brown - (019.02) -	4	body -							-	interior line - all join
0120.A015	B - 01	Unidentifiable - Pearlware - mocha - (016.00) -	1	body -							-	exterior decoration
0119.A007	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -							-	unglazed exterior
0120.A001	B - 01	Plate - Redware - coggle edge & slipped-lead-clear - (072.50) -	1	rim -							-	unglazed exterior
0120.A004	B - 01	Plate - Redware - slipped-lead glaze-clear - (072.20) -	2	body -							-	same vessel? - 1 with unglazed exterior
0120.A018	B - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	2	body -							-	
0119.A002	A - 01	Unidentifiable - Whiteware/Ironstone - undecorated - (023.00) -	2	body -							-	
0119.A009	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	4	paste fragment -							-	
0119.A005	A - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -	1	body -							-	glazed one side - no opposing surface
0120.A003	B - 01	Plate - Redware - slipped-lead/mang. glaze-brown - (072.21) -	1	rim -							-	unglazed exterior - missing interior surface
0120.A008	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	5	body -							-	glazed both sides
0120.A007	B - 01	Unidentifiable - Redware - slipped-lead/mang. glaze-brown - (072.21) -	2	body -							-	unglazed exterior
0119.A006	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -							-	pale red paste - glazed one side - no opposing surface
0120.A010	B - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	2	body -							-	glazed one side - no opposing surface

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0049 (N00300/W00350)											
Household Ceramics											
0120.A009	B - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	unglazed exterior
0120.A002	B - 01	Unidentifiable - Redware - slipped-lead/mang. glaze-brown - (072.21) -	1	rim -						-	glazed both sides
0120.A012	B - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	7	paste fragment -						-	
0120.A006	B - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -	2	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**60**								
Miscellaneous Personal and Small Finds											
0120.M001	B - 01	Generic lamp part-chimney-- - - molded - -64th	1	body - glass (J20060) Colorless	undec.					-	
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0119.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)		0.5				-	Discarded in lab
0119.C000	A - 01	brick - unidentifiable	3	body - Orange - brick (J20010)		22.4				-	Discarded in lab
0119.C000	A - 01	brick - unidentifiable	5	body - Red - brick (J20010)		4.0				-	Discarded in lab
0120.C000	B - 01	glazing (window glass) - plate	5	fragment - Aqua - glass (J20060)		3.2				-	Discarded in lab
0120.C000	B - 01	brick - unidentifiable	5	body - Red - brick (J20010)		3.6				-	Discarded in lab
0120.C000	B - 01	brick - unidentifiable	9	body - Orange - brick (J20010)		9.2				-	Discarded in lab
0120.C006	B - 01	drain pipe - molded	1	fragment - Gray - stoneware (J20110)						-	dark red glazed interior
0120.C000	B - 01	mortar - ground and mixed	1	fragment - White - mortar (P26050)		0.8				-	Discarded in lab - sand temper
0120.C008	B - 01	nail - unidentifiable	1	head and shank - - - fe (iron) (E15080)						-	
0120.C007	B - 01	nail - hand wrought/forged	1	head and shank - - - fe (iron) (E15080)						-	
0120.C000	B - 01	coal - quarried	4	fragment - - - coal (F16030)		5.7				-	Discarded in lab
		Totals: **Construction and Waste Material**	**36**			**49.4**					
		Totals: **ST #0049 (N00300/W00350)**	**97**			**49.4**					
ST #0050 (N00300/W00400)											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0050 (N00300/W00400)												
Household Ceramics												
0122.A009	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	2	body -							-	1 glazed both sides
0122.A002	A - 01	Unidentified (sherd-level ident.) - Creamware - undecorated - (007.00) -	1	body -							-	
0122.A011	A - 01	Unidentified (sherd-level ident.) - Earthenware - paste fragment-red bodied - (099.11) -	5	paste fragment -							-	1 with unglazed exterior
0122.A006	A - 01	Unidentified (sherd-level ident.) - Yellowware - American-undecorated - (039.00) -	1	body -							-	
0122.A003	A - 01	Unidentifiable - Pearlware - mocha - (016.00) -	1	body -							-	small sherd
0122.A010	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	4	body -							-	glazed one side - no opposing surface
0122.A001	A - 01	Plate - Staffordshire slipware w/coggle edge - (074.50) -	1	rim -							-	small rim sherd
0122.A004	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - printed-lt. blue - (024.30) -	1	body -							-	
0122.A008	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead glaze-clear - (072.10) -	2	chip -							-	small chips
0122.A005	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	1	Rim -							-	
0122.A007	A - 01	Unidentified (sherd-level ident.) - Refined redware - undecorated - (073.00) -	1	body -							-	glazed both sides
		Totals: **Household Ceramics**	**20**									
Miscellaneous Personal and Small Finds												
0122.M001	A - 01	Pitch pipe-- - - multiple processes - -64th	1	reed plate - mixed metals (C13301) -		undecorated			0.6	1.0	-	pb and cu alloys - slightly irregular shape - not sure if this is the upper or lower reed plate - or if there is just one plate in a pitch pipe
		Totals: **Miscellaneous Personal and Small Finds**	**1**									
Construction and Waste Material												
0122.C004	A - 01	nail - Wrought or Cut	2	head and shank - - - fe (iron) (E15080)							-	
0122.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)			2.6				-	Discarded in lab

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0050 (N00300/W00400)											
Construction and Waste Material											
0122.C000	A - 01	glazing (window glass) - plate	2	fragment - Aqua - glass (J20060)						-	Discarded in lab
0122.C005	A - 01	nail - Wrought or Cut	1	shank - - - fe (iron) (E15080)						-	
0122.C000	A - 01	brick - unidentifiable	36	body - Orange - brick (J20010)		34.5				-	Discarded in lab
		Totals: **Construction and Waste Material**	**44**			**37.1**					
		Totals: **ST #0050 (N00300/W00400)**	**65**			**37.1**					
ST #0051 (N00300/W00450)											
Household Ceramics											
0125.A003	B - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
0125.A001	B - 01	Unidentifiable - Pearlware - undecorated - (014.00) -	1	body -						-	small sherd
0124.A001	A - 01	Unidentifiable - Whiteware/Ironstone - hand painted-underglaze-polychrome - (033.00) -	1	body -						-	exterior decoration
0125.A002	B - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**4**								
Miscellaneous Personal and Small Finds											
0125.M001	B - 01	Clay Pigeon-standard- - - molded - -64th	1	rim - silt & pitch (skeet) (H18040) Black	undecorated					-	
0124.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	rim and body - silt & pitch (skeet) (H18040) Black	yellow paint					-	2 objects
0125.M002	B - 01	Food Service - Drinkware (Glass) - - molded - -64th	1	rim - glass (J20060) Colorless	undecorated					-	plain beaded rim
		Totals: **Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material											
0125.C000	B - 01	coal - quarried	1	fragment - - - coal (F16030)		0.4				-	Discarded in lab
0125.C000	B - 01	brick - unidentifiable	1	body - Red - brick (J20010)		2.4				-	Discarded in lab
0124.C000	A - 01	brick - unidentifiable	1	body - Red - brick (J20010)		0.7				-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**3.5**					
		Totals: **ST #0051 (N00300/W00450)**	**11**			**3.5**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0052 (N00300/W00500)											
Miscellaneous Personal and Small Finds											
0127.M002	A - 01	Clay Pigeon-standard- - - molded - -64th	2	body - silt & pitch (skeet) (H18040) Black	red painted					Unidentifiable - unidetifiable	dimpled exterior - 1 with unidentifiable letter or number molded
0127.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	rim and body - silt & pitch (skeet) (H18040) Black	yellow paint					-	
0127.M003	A - 01	Clay Pigeon-standard- - - molded - -64th	2	body - silt & pitch (skeet) (H18040) Black	undecorated					-	
		Totals: **Miscellaneous Personal and Small Finds**	**6**								
Glass Bottles and Commercial Containers											
0129.G001	C - 01	Containers - Unidentifiable - turned	1	- body - stoneware - Other	undecorated					- unidentifiable	gray paste - exterior mottled gray and brown salt-glaze
		Totals: **Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material											
0129.C000	C - 01	brick - unidentifiable	1	body - Red - brick (J20010)		0.2				-	Discarded in lab
0128.C000	B - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.8				-	Discarded in lab
		Totals: **Construction and Waste Material**	**2**			**1.0**					
		Totals: **ST #0052 (N00300/W00500)**	**9**			**1.0**					
ST #0053 (N00300/W00500)											
Miscellaneous Personal and Small Finds											
0132.M001	B - 01	Clay Pigeon-standard- - - molded - -64th	2	body - silt & pitch (skeet) (H18040) Black	painted - red					-	with painted and dimpled exterior surface - 1 red - 1 yellow
0131.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	1	body - silt & pitch (skeet) (H18040) Black	yellow paint					-	small fragment
		Totals: **Miscellaneous Personal and Small Finds**	**3**								
Construction and Waste Material											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0053 (N00300/W00500)											
Construction and Waste Material											
0132.C000	B - 01	coal - quarried	1	fragment - - - coal (F16030)		0.6				-	Discarded in lab
0132.C000	B - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.2				-	Discarded in lab
0131.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.7				-	Discarded in lab
0132.C003	B - 01	nail - machine cut with unident. head	1	head and shank - - - fe (iron) (E15080)						-	
		Totals: **Construction and Waste Material**	**4**			**1.5**					
		Totals: **ST #0053 (N00300/W00500)**	**7**			**1.5**					
ST #0054 (N00300/W00575)											
Household Ceramics											
0134.A001	A - 01	Unidentified (sherd-level ident.) - Redware - slipped-lead glaze-clear - (072.20) -	1	body -						-	small sherd - fresh break - assumed to have a lead glaze - no surface one side
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0134.M004	A - 01	Clay Pigeon-standard- - - molded - -64th	1	rim - silt & pitch (skeet) (H18040) Black	undecorated					-	
0134.M003	A - 01	Clay Pigeon-standard- - - molded - -64th	2	body - silt & pitch (skeet) (H18040) Black	red painted					Unidentifiable - WHT... R	may be same object - do not mend
0134.M002	A - 01	Clay Pigeon-standard- - - molded - -64th	5	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	one with dimpled exterior
0134.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	rim and body - silt & pitch (skeet) (H18040) Black	yellow paint					-	one body sherd with yellow dimpled exterior
		Totals: **Miscellaneous Personal and Small Finds**	**10**								
Construction and Waste Material											
0134.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.2**					
		Totals: **ST #0054 (N00300/W00575)**	**12**			**0.2**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0055 (N00300/W00600)											
Prehistoric Material											
0137.P001	B - 01	Hollowware - food storage-cooking (PBA0199000) -	1	body - silicates (natural) Brown other (K21990)						-	appears to be either incised or an eroded cord wrapped stick surface treament
		Totals: **Prehistoric Material**	**1**								
Miscellaneous Personal and Small Finds											
0137.M001	B - 01	Clay Pigeon-standard- - - molded - -64th	3	body - silt & pitch (skeet) (H18040) Black	red painted					-	one with red painting and dimpled exterior
0136.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	painted exterior
0136.M002	A - 01	Clay Pigeon-standard- - - molded - -64th	1	body - silt & pitch (skeet) (H18040) Black	undecorated					-	
		Totals: **Miscellaneous Personal and Small Finds**	**6**								
Construction and Waste Material											
0136.C000	A - 01	brick - unidentifiable	1	body - Red - brick (J20010)		21.4				-	Discarded in lab
0136.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.4				-	Discarded in lab
0137.C000	B - 01	brick - unidentifiable	2	body - Red - brick (J20010)		25.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**47.0**					
		Totals: **ST #0055 (N00300/W00600)**	**11**			**47.0**					
ST #0056 (N00325/W00600)											
Prehistoric Material											
0140.P001	B - 01	Fire-cracked rock - (PAP0000000) -	1	fragment with cortex - silicates (natural) Grey quartzite (K21140)						-	reddened exterior
		Totals: **Prehistoric Material**	**1**								
Miscellaneous Personal and Small Finds											
0139.M002	A - 01	Clay Pigeon-standard- - - molded - -64th	1	body - silt & pitch (skeet) (H18040) Black	yellow paint					-	with painted and dimpled exterior
0139.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	body - silt & pitch (skeet) (H18040) Black	red painted					-	one with painted and dimpled exterior

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0056 (N00325/W00600)											
		Totals: **Miscellaneous Personal and Small Finds**	**3**								
Construction and Waste Material											
0139.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**								
		Totals: **ST #0056 (N00325/W00600)**	**5**								
ST #0057 (N00350/W00000)											
Household Ceramics											
0141.A002	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed one side - no opposing surface
0141.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed exterior - worn interior
		Totals: **Household Ceramics**	**2**								
Construction and Waste Material											
0141.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.1				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**0.1**					
		Totals: **ST #0057 (N00350/W00000)**	**3**			**0.1**					
ST #0058 (N00350/W00050)											
Household Ceramics											
0143.A002	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead glaze-clear - (072.10) -	1	body -						-	glazed one side - no opposing surface
0143.A001	A - 01	Unidentifiable - Earthenware - burnt-unrecognisable type - (100.00) -	1	body -						-	appears to be blue transfer printed white-bodied ware
		Totals: **Household Ceramics**	**2**								
Construction and Waste Material											
0143.C000	A - 01	brick - unidentifiable	4	body - Red - brick (J20010)		14.7				-	Discarded in lab
0143.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.1				-	Discarded in lab

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0058 (N00350/W00050)												
		Totals:	**Construction and Waste Material**	**5**			**14.8**					
		Totals:	**ST #0058 (N00350/W00050)**	**7**			**14.8**					
ST #0059 (N00350/W00100)												
Household Ceramics												
0145.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -		1	paste fragment -						-	
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0145.C000	A - 01	brick - unidentifiable		1	body - Red - brick (J20010)		0.2				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**1**			**0.2**					
		Totals:	**ST #0059 (N00350/W00100)**	**2**			**0.2**					
ST #0060 (N00350/W00150)												
Household Ceramics												
0147.A001	A - 01	Unidentified (sherd-level ident.) - Creamware - undecorated - (007.00) -		1	chip -						-	
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0147.C001	A - 01	nail - unidentifiable		1	shank - - - fe (iron) (E15080)						-	
		Totals:	**Construction and Waste Material**	**1**								
		Totals:	**ST #0060 (N00350/W00150)**	**2**								
ST #0061 (N00350/W00200)												
Household Ceramics												
0149.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -		4	body -						-	2 join - other fresh breaks - glazed both sides
		Totals:	**Household Ceramics**	**4**								
Miscellaneous Personal and Small Finds												
0149.M001	A - 01	glass chip-aqua- - - unidentifiable - -64th		1	fragment - glass (J20060) Aqua, Dark	undec.					-	appears to be bottle glass

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0061 (N00350/W00200)											
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0149.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		1.1				-	Discarded in lab
0149.C000	A - 01	brick - unidentifiable	1	body - Orange - brick (J20010)		0.1				-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**1.2**					
		Totals: **ST #0061 (N00350/W00200)**	**8**			**1.2**					
ST #0062 (N00350/W00250)											
Household Ceramics											
0151.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	2	body -						-	glazed one side - no opposing surface
		Totals: **Household Ceramics**	**2**								
Miscellaneous Personal and Small Finds											
0151.M001	A - 01	Generic lamp part-chimney-- - - molded - -64th	1	body - glass (J20060) Colorless	undec.					-	
0151.M002	A - 01	metal fragment-iron-wire - - drawn - -64th	4	fragment - fe (iron) (E15080) -	-					-	rusted
		Totals: **Miscellaneous Personal and Small Finds**	**5**								
Construction and Waste Material											
0151.C000	A - 01	brick - unidentifiable	2	body - Red - brick (J20010)		1.0				-	Discarded in lab
0151.C000	A - 01	mortar - ground and mixed	1	fragment - White - mortar (P26050)		0.1				-	sand temper - Discarded in lab
0151.C000	A - 01	coal - quarried	4	fragment - - - coal (F16030)		3.9				-	Discarded in lab
0151.C000	A - 01	brick - unidentifiable	4	body - Orange - brick (J20010)		0.6				-	Discarded in lab
		Totals: **Construction and Waste Material**	**11**			**5.6**					
		Totals: **ST #0062 (N00350/W00250)**	**18**			**5.6**					
ST #0063 (N00350/W00300)											
Household Ceramics											
0153.A002	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	

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Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0063 (N00350/W00300)												
Household Ceramics												
0153.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -							-	unglazed exterior
		Totals: **Household Ceramics**	**2**									
Construction and Waste Material												
0153.C000	A - 01	glazing (window glass) - plate	1	fragment -	Aqua - glass (J20060)						-	Discarded in lab
0153.C000	A - 01	brick - unidentifiable	1	body -	Orange - brick (J20010)		1.0				-	Discarded in lab
		Totals: **Construction and Waste Material**	**2**				**1.0**					
		Totals: **ST #0063 (N00350/W00300)**	**4**				**1.0**					
ST #0064 (N00350/W00350)												
Household Ceramics												
0156.A008	A - 01	Unidentifiable - Redware - (072.00) -	7	body -							-	unglazed exterior - no opposing surface
0156.A001	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - spatter or sponged - (035.00) -	2	body -							-	one may be transfer printed - blue - glazed one side - no opposing surface
0156.A002	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	2	body -							-	
0157.A001	B - 01	Unidentifiable - Redware - (072.00) -	1	body -							-	unglazed exterior
0156.A004	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -							-	glazed both sides
0156.A005	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -							-	unglazed interior
0156.A009	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	5	paste fragment -							-	
0156.A003	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -	3	body -							-	1 glazed one side - unglazed exterior - 2 with slip on one side no opposing surface

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0064 (N00350/W00350)											
Household Ceramics											
0156.A006	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	unglazed exterior - thick bodied - with was on exterior
0156.A007	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	2	fragment -						-	small sherds
		Totals: **Household Ceramics**	**25**								
Miscellaneous Personal and Small Finds											
0156.M001	A - 01	glass chip-colorless- - - unidentifiable - -64th	1	chips - glass (J20060) Colorless	undec.					-	
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Construction and Waste Material											
0156.C000	A - 01	glazing (window glass) - plate	3	fragment - - - glass (J20060)						-	a variety of colors: light olive, aqua, colorless; Discarded in lab
0157.C000	B - 01	brick - unidentifiable	1	body - Red - brick (J20010)		0.5				-	Discarded in lab
0156.C005	A - 01	spike - hand wrought/forged	1	whole - - - fe (iron) (E15080)				3.0		-	large roughly rectangular head - rusted
0156.C000	A - 01	brick - unidentifiable	26	body - Orange - brick (J20010)		16.8				-	Discarded in lab
0156.C000	A - 01	coal - quarried	2	fragment - - - coal (F16030)		0.9				-	Discarded in lab
0156.C000	A - 01	brick - unidentifiable	10	body - Red - brick (J20010)		23.6				-	Discarded in lab
		Totals: **Construction and Waste Material**	**43**			**41.8**					
		Totals: **ST #0064 (N00350/W00350)**	**69**			**41.8**					
ST #0065 (N00350/W00400)											
Household Ceramics											
0158.A001	A - 01	Unidentifiable - Earthenware - paste fragment- buff bodied - (099.13) -	1	paste fragment -						-	probably a tin-glazed ware
0158.A015	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	2	body -						-	unglazed exterior
0158.A003	A - 01	Unidentifiable - Pearlware - undecorated - (014.00) -	1	body -						-	

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Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color - Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0065 (N00350/W00400)											
Household Ceramics											
0158.A009	A - 01	Plate - Redware - coggle edge & slipped-lead-clear - (072.50) -	1	rim -						-	small sherd
0158.A013	A - 01	Tankard - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	base -						-	glazed both sides
0158.A007	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	1	Rim -						-	
0158.A016	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	5	body -						-	glazed one side - no opposing surface - 2 join - fresh break - with spot of glaze on mostly unglazed surface
0158.A002	A - 01	Unidentified (sherd-level ident.) - Pearlware - transfer printed-blue - (019.20) -	1	body -						-	tiny bit of glaze remaining on one side
0158.A011	A - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -	2	body -						-	1 small sherd - 1 with unglazed exterior
0158.A006	A - 01	Unidentifiable - Whiteware/Ironstone - stick-stamped-polychrome - (035.12) -	1	body -						-	red and green exterior decoration - fresh break - no interior surface
0158.A010	A - 01	Unidentifiable - Redware - coggle edge-lead glaze-clear - (072.40) -	1	rim -						-	small chip
0158.A008	A - 01	Unidentified (sherd-level ident.) - Earthenware - burnt-unrecognisable type - (100.00) -	1	body -						-	white paste
0158.A014	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	4	body -						-	glazed both sides - 1 near rim
0158.A018	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	4	paste fragment -						-	
0158.A012	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	1	body -						-	mottled glaze - unglazed exterior
0158.A005	A - 01	Unidentifiable - Whiteware/Ironstone - annular designs-slip decorated - (024.82) -	1	body -						-	exterior line of tan slip
0158.A017	A - 01	Unidentified (sherd-level ident.) - Redware - (072.00) -	5	body -						-	unglazed exterior - no opposing surface
0158.A004	A - 01	Unidentifiable - Whiteware/Ironstone - printed-lt. blue - (024.30) -	1	rim -						-	glazed one side - no opposing surface

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0065 (N00350/W00400)											
		Totals: **Household Ceramics**	**34**								
Miscellaneous Personal and Small Finds											
0158.M001	A - 01	Food Service - Drinkware (Glass) - - molded - -64th	1	body - glass (J20060) Colorless	exterior pane					-	
		Totals: **Miscellaneous Personal and Small Finds**	**1**								
Glass Bottles and Commercial Containers											
0158.G001	A - 01	Containers - Unidentifiable - molded	1	- finish - glass - Aqua, Light	undec.					-	small chip with rounded lip
0158.G002	A - 01	Containers - Unidentifiable - molded	1	- body - glass - Blue-green	undec.					-	
		Totals: **Glass Bottles and Commercial Containers**	**2**								
Construction and Waste Material											
0158.C000	A - 01	brick - unidentifiable	1	fragment w/ 1 dim. (height) - Red - brick (J20010)		127.3	2.3			-	
0158.C000	A - 01	brick - unidentifiable	39	body - Orange - brick (J20010)		58.2				-	Discarded in lab
0158.C000	A - 01	brick - unidentifiable	23	body - Red - brick (J20010)		180.2				-	Discarded in lab
0158.C005	A - 01	nail - Wrought or Cut	2	head and shank - - - fe (iron) (E15080)						-	
0158.C006	A - 01	mortar - ground and mixed	2	fragment - White - mortar (P26050)		1.3				-	sand temper - discarded in lab
0158.C000	A - 01	glazing (window glass) - plate	14	fragment - Aqua - glass (J20060)						-	Discarded in lab
		Totals: **Construction and Waste Material**	**81**			**367.0**					
		Totals: **ST #0065 (N00350/W00400)**	**118**			**367.0**					
ST #0066 (N00350/W00450)											
Household Ceramics											
0160.A003	A - 01	Unidentifiable - Redware - slipped-lead glaze-clear - (072.20) -	1	body -						-	glazed interior - no opposing surface
0160.A002	A - 01	Unidentified (sherd-level ident.) - Whiteware/Ironstone - undecorated - (023.00) -	1	body -						-	
0160.A005	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	2	body -						-	unglazed exterior
0160.A004	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed both sides

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0066 (N00350/W00450)											
Household Ceramics											
0160.A008	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	2	paste fragment -						-	
0160.A007	A - 01	Unidentifiable - Redware - (072.00) -	4	body -						-	unglazed exterior
0160.A001	A - 01	Unidentified (sherd-level ident.) - Pearlware - undecorated - (014.00) -	1	body -						-	
0160.A006	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	2	body -						-	unglazed exterior
		Totals: **Household Ceramics**	**14**								
Glass Bottles and Commercial Containers											
0160.G001	A - 01	Containers - Unidentifiable - blown	1	- body - glass - Olive Green, Li						-	
		Totals: **Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material											
0160.C000	A - 01	brick - unidentifiable	2	body - Orange - brick (J20010)		2.9				-	Discarded in lab
0160.C000	A - 01	brick - unidentifiable	6	body - Red - brick (J20010)		1.6				-	Discarded in lab
		Totals: **Construction and Waste Material**	**8**			**4.5**					
		Totals: **ST #0066 (N00350/W00450)**	**23**			**4.5**					
ST #0067 (N00350/W00500)											
Miscellaneous Personal and Small Finds											
0162.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	3	body - silt & pitch (skeet) (H18040) Black	yellow paint					-	painted exterior with dimples - 1 fresh break
0162.M002	A - 01	glass chip-aqua- - - unidentifiable - -64th	1	chips - glass (J20060) Aqua	undec.					-	
		Totals: **Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material											
0162.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.9				-	Discarded in lab
0162.C000	A - 01	brick - unidentifiable	2	body - Orange - brick (J20010)		2.6				-	
0162.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	
		Totals: **Construction and Waste Material**	**4**			**3.5**					

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
		Totals: **ST #0067 (N00350/W00500)**	**8**			**3.5**					
ST #0068 (N00350/W00550)											
Household Ceramics											
0164.A001	A - 01	Plate - Redware - slipped-lead/mang. glaze-brown w. green colorant - (072.16) -	1	rim -						-	with coggle edge - thick bodied
0164.A002	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
		Totals: **Household Ceramics**	**2**								
Miscellaneous Personal and Small Finds											
0164.M002	A - 01	Clay Pigeon-standard- - - molded - -64th	1	body - silt & pitch (skeet) (H18040) Black	yellow paint					-	
0164.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	3	body - silt & pitch (skeet) (H18040) Black	red painted					Unidentifiable - FL...	1 with lettering
		Totals: **Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material											
0164.C000	A - 01	slag - unidentifiable	2	fragment - - - coal (F16030)		10.9				-	Discarded in lab
0164.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		1.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**12.1**					
		Totals: **ST #0068 (N00350/W00550)**	**9**			**12.1**					
ST #0069 (N00350/W00600)											
Household Ceramics											
0166.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0166.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	2	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	
		Totals: **Miscellaneous Personal and Small Finds**	**2**								
		Totals: **ST #0069 (N00350/W00600)**	**3**								
ST #0070 (N00400/W00000)											

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0070 (N00400/W00000)											
Prehistoric Material											
0168.P001	A - 01	Waste flakes-unutilized - unidentifiable (PAL9900000) -	1	fragment - stone Other schist (M23220)						-	mica schist - mottled gray-black - may be non-cultural
		Totals: **Prehistoric Material**	**1**								
Household Ceramics											
0168.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	rim -						-	large vessel
		Totals: **Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds											
0168.M000	A - 01	Unidentifiable-- - - molded - -64th	2	fragment - polystyrene (N24130) White	undecorated					-	styrofoam - may be a commercial container - discarded in lab
		Totals: **Miscellaneous Personal and Small Finds**	**2**								
Construction and Waste Material											
0168.C000	A - 01	brick - unidentifiable	2	body - Red - brick (J20010)		7.2				-	Discarded in lab
0168.C000	A - 01	asphalt - ground and mixed	2	fragment - - - asphalt (H18020)		2.4				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**9.6**					
		Totals: **ST #0070 (N00400/W00000)**	**8**			**9.6**					
ST #0074 (N00400/W00200)											
Household Ceramics											
0176.A002	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	2	paste fragment -						-	
0176.A001	A - 01	Unidentified (sherd-level ident.) - Redware - (072.00) -	1	body -						-	unglazed exterior
		Totals: **Household Ceramics**	**3**								
Miscellaneous Personal and Small Finds											
0176.M001	A - 01	metal fragment-iron-wire - - drawn - -64th	1	fragment - fe (iron) (E15080) -	-					-	rusted - in two pieces
		Totals: **Miscellaneous Personal and Small Finds**	**1**								

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0074 (N00400/W00200)											
Construction and Waste Material											
0176.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.6				-	Discarded in lab
0176.C000	A - 01	brick - unidentifiable	3	body - Red - brick (J20010)		2.6				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**3.2**					
		Totals: **ST #0074 (N00400/W00200)**	**8**			**3.2**					
ST #0076 (N00400/W00300)											
Construction and Waste Material											
0180.C000	A - 01	coal - quarried	1	fragment - - - coal (F16030)		0.3				-	Discarded in lab
0180.C003	A - 01	nail - Wrought or Cut	1	head and shank - - - fe (iron) (E15080)						-	heavily rusted
0180.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	Discarded in lab
		Totals: **Construction and Waste Material**	**3**			**0.3**					
		Totals: **ST #0076 (N00400/W00300)**	**3**			**0.3**					
ST #0077 (N00400/W00350)											
Household Ceramics											
0182.A006	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	2	paste fragment -						-	
0182.A002	A - 01	Plate - Redware - coggle edge & slipped-lead/mang.-brown - (072.51) -	1	rim -						-	unglazed exterior
0182.A005	A - 01	Unidentifiable - Redware - (072.00) -	1	rim -						-	unglazed exterior - no opposing surface
0182.A001	A - 01	Unidentifiable - Yellowware - American-undecorated - (039.00) -	1	body -						-	
0182.A003	A - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -	1	body -						-	glazed one side - no opposing surface
0182.A004	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed exterior - no opposing surface
		Totals: **Household Ceramics**	**7**								
Construction and Waste Material											
0182.C000	A - 01	brick - unidentifiable	2	fragment - Red - brick (J20010)		1.3				-	Discarded in lab

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Catnum	Stratum	Object - Manufacture			Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek													
ST #0077 (N00400/W00350)													
Construction and Waste Material													
0182.C000	A - 01	coal - quarried			1	fragment - - - coal (F16030)		2.6				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**3**			**3.9**					
			Totals:	**ST #0077 (N00400/W00350)**	**10**			**3.9**					
ST #0078 (N00400/W00400)													
Household Ceramics													
0184.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -			1	paste fragment -						-	
			Totals:	**Household Ceramics**	**1**								
Glass Bottles and Commercial Containers													
0184.G001	A - 01	Containers - Unidentifiable - molded			1	- body - glass - Aqua, Dark	undec.					-	
			Totals:	**Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material													
0184.C000	A - 01	glazing (window glass) - plate			1	fragment - Aqua, Light - glass (J20060)						-	Discarded in lab
0184.C000	A - 01	coal - quarried			1	fragment - - - coal (F16030)		0.2				-	Discarded in lab
0184.C000	A - 01	brick - unidentifiable			1	fragment - Red - brick (J20010)		1.0				-	Discarded in lab
0184.C000	A - 01	coal - quarried			2	fragment - - - coal (F16030)		3.7				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**5**			**4.9**					
			Totals:	**ST #0078 (N00400/W00400)**	**7**			**4.9**					
ST #0079 (N00400/W00450)													
Household Ceramics													
0186.A001	A - 01	Unidentified (sherd-level ident.) - Pearlware - hand painted polychrome - (019.00) -			1	body -						-	
0186.A002	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -			1	body -						-	glazed one side - no opposing surface
			Totals:	**Household Ceramics**	**2**								
Construction and Waste Material													

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0079 (N00400/W00450)											
Construction and Waste Material											
0186.C000	A - 01	brick - unidentifiable	2	body - Red - brick (J20010)		0.9				-	Discarded in lab
0186.C003	A - 01	nail - unidentifiable	1	shank - - - fe (iron) (E15080)						-	
0186.C000	A - 01	glazing (window glass) - plate	1	fragment - Aqua - glass (J20060)						-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**0.9**					
		Totals: **ST #0079 (N00400/W00450)**	**6**			**0.9**					
ST #0080 (N00400/W00500)											
Household Ceramics											
0188.A001	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	glazed one side - no opposing surface
0189.A001	B - 01	Unidentified (sherd-level ident.) - Redware - (072.00) -	1	body -						-	unglazed exterior - no opposing surface
0188.A002	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
		Totals: **Household Ceramics**	**3**								
Construction and Waste Material											
0188.C000	A - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		3.5				-	Discarded in lab
0188.C000	A - 01	coal - quarried	3	fragment - - - coal (F16030)		2.9				-	Discarded in lab
		Totals: **Construction and Waste Material**	**4**			**6.4**					
		Totals: **ST #0080 (N00400/W00500)**	**7**			**6.4**					
ST #0081 (N00400/W00550)											
Miscellaneous Personal and Small Finds											
0190.M001	A - 01	Clay Pigeon-standard- - - molded - -64th	4	rim and body - silt & pitch (skeet) (H18040) Black	red painted					-	dimpled and painted exterior - 2 join - appear to all be from one object
		Totals: **Miscellaneous Personal and Small Finds**	**4**								
Construction and Waste Material											

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0081 (N00400/W00550)												
Construction and Waste Material												
0190.C000	A - 01	brick - unidentifiable		3	fragment - Orange - brick (J20010)						-	Discarded in lab
0190.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		1.4				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**1.4**					
		Totals:	**ST #0081 (N00400/W00550)**	**8**			**1.4**					
ST #0082 (N00400/W00600)												
Household Ceramics												
0192.A001	A - 01	Unidentified (sherd-level ident.) - Pearlware - undecorated - (014.00) -		1	body -						-	
		Totals:	**Household Ceramics**	**1**								
Miscellaneous Personal and Small Finds												
0192.M001	A - 01	Clay Pigeon-standard- - - molded - -64th		3	body - silt & pitch (skeet) (H18040) Black	red painted					Unidentifiable - A...	painted exterior - 1 with letter
		Totals:	**Miscellaneous Personal and Small Finds**	**3**								
		Totals:	**ST #0082 (N00400/W00600)**	**4**								
ST #0087 (N00445/W00500)												
Prehistoric Material												
0203.P001	A - 01	Waste flakes-unutilized - tertiary flake (PAL0300000) -		1	fragment - silicates (natural) Red, Dark jasper (K21100)						-	small flake
		Totals:	**Prehistoric Material**	**1**								
Construction and Waste Material												
0203.C000	A - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.6				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**1**			**0.6**					
		Totals:	**ST #0087 (N00445/W00500)**	**2**			**0.6**					
ST #0089 (N00450/W00000)												
Miscellaneous Personal and Small Finds												
0207.M002	A - 01	Generic lamp part-lightbulb-incandescent - - - molded - -64th		1	body - glass (J20060) Colorless	undecorated					-	thin glass

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Catnum	Stratum	Object - Manufacture		Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek												
ST #0089 (N00450/W00000)												
Miscellaneous Personal and Small Finds												
0207.M001	A - 01	Unidentifiable-- - - molded - -64th		2	fragment - plastic (N24090) Colorless	undecorated					-	rigid pplastic - discarded in lab
		Totals:	**Miscellaneous Personal and Small Finds**	**3**								
Glass Bottles and Commercial Containers												
0207.G001	A - 01	Closures - Bottle - molded		1	- fragment - plastic - Colorless	-					-	discarded in lab
		Totals:	**Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material												
0207.C000	A - 01	brick - unidentifiable		1	fragment - Orange - brick (J20010)		0.5				-	Discarded in lab
0207.C000	A - 01	brick - unidentifiable		1	fragment - Red - brick (J20010)		1.0				-	reddish orange - Discarded in lab
0207.C000	A - 01	coal - quarried		1	fragment - - - coal (F16030)		2.0				-	Discarded in lab
0207.C000	A - 01	mortar - ground and mixed		1	fragment - White - mortar (P26050)		0.3				-	Discarded in lab
0207.C000	A - 01	glazing (window glass) - plate		2	fragment - Colorless - glass (J20060)						-	may be plastic?
		Totals:	**Construction and Waste Material**	**6**			**3.8**					
		Totals:	**ST #0089 (N00450/W00000)**	**10**			**3.8**					
ST #0091 (N00448/W00100)												
Household Ceramics												
0211.A001	A - 01	Unidentifiable - Redware - (072.00) -		1	fragment -						-	small chip - may be brick?
		Totals:	**Household Ceramics**	**1**								
Construction and Waste Material												
0211.C000	A - 01	coal - quarried		2	fragment - - - coal (F16030)		1.1				-	Discarded in lab
0211.C000	A - 01	brick - unidentifiable		2	fragment - Red - brick (J20010)		4.6				-	Discarded in lab
		Totals:	**Construction and Waste Material**	**4**			**5.7**					
		Totals:	**ST #0091 (N00448/W00100)**	**5**			**5.7**					
ST #0092 (N00448/W00150)												

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0092 (N00448/W00150)											
Household Ceramics											
0213.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
		Totals: **Household Ceramics**	**1**								
Construction and Waste Material											
0213.C000	A - 01	brick - unidentifiable	1	fragment - Red - brick (J20010)		1.1				-	Discarded in lab
		Totals: **Construction and Waste Material**	**1**			**1.1**					
		Totals: **ST #0092 (N00448/W00150)**	**2**			**1.1**					
ST #0093 (N00450/W00200)											
Household Ceramics											
0215.A001	A - 01	Unidentifiable - Redware - (072.00) -	1	body -						-	unglazed exterior - no opposing surface
		Totals: **Household Ceramics**	**1**								
Glass Bottles and Commercial Containers											
0215.G001	A - 01	Containers - Unidentifiable - Mold-Blown Manufacturing Unidentifiable	1	- body - glass - Olive Green	undecorated					-	case bottle?
		Totals: **Glass Bottles and Commercial Containers**	**1**								
Construction and Waste Material											
0215.C000	A - 01	brick - unidentifiable	2	fragment w/ 1 dim. (height) - Red - brick (J20010)		143.3	2.0			-	mend - Discarded in lab
		Totals: **Construction and Waste Material**	**2**			**143.3**					
		Totals: **ST #0093 (N00450/W00200)**	**4**			**143.3**					
ST #0095 (N00450/W00300)											
Prehistoric Material											
0219.P001	A - 01	Unidentifiable - (PAZ0000000) -	1	fragment - silicates (natural) White quartz (K21130)						-	cobble fragment with cortex - some veining - may be non-cultural
		Totals: **Prehistoric Material**	**1**								

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0095 (N00450/W00300)											
Household Ceramics											
0219.A001	A - 01	Unidentifiable - Redware - slipped int.-lead/mang. glaze-mottled brown -ext. lead glz. - (072.18) -	1	body -						-	glazed both sides
0219.A003	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -	1	paste fragment -						-	
0219.A002	A - 01	Unidentified (sherd-level ident.) - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	small sherd with glaze speck
		Totals: **Household Ceramics**	**3**								
Glass Bottles and Commercial Containers											
0219.G000	A - 01	Containers - Unidentifiable - unidentifiable	1	- body - glass - Olive Green	-					-	chip
		Totals: **Glass Bottles and Commercial Containers**	**1**								
		Totals: **ST #0095 (N00450/W00300)**	**5**								
ST #0096 (N00450/W00350)											
Miscellaneous Personal and Small Finds											
0221.M001	A - 01	Unidentifiable-- - - machine made - -64th	1	fragment - synthetic (D14100) Gray	painted on o					-	thin object - may be fiberglass - 2 coats of paint on one side - opposing side has an impressed pattern - discarded in lab
0221.M002	A - 01	metal fragment-iron- - - sheet - -64th	2	fragment - fe (iron) (E15080) -	undecorated				0.4	-	with three punched holes - in two pieces
		Totals: **Miscellaneous Personal and Small Finds**	**3**								
		Totals: **ST #0096 (N00450/W00350)**	**3**								
ST #0122 (N00500/W00150)											
Household Ceramics											
0263.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -	3	body -						-	dark brown glaze - unglazed exterior - 2 join
		Totals: **Household Ceramics**	**3**								

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Catnum	Stratum	Object - Manufacture			Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek													
ST #0122 (N00500/W00150)													
Construction and Waste Material													
0263.C000	A - 01	brick - molded			2	fragment - Red - brick (J20010)		327.6				-	
			Totals:	**Construction and Waste Material**	**2**			**327.6**					
			Totals:	**ST #0122 (N00500/W00150)**	**5**			**327.6**					
ST #0123 (N00500/W00200)													
Household Ceramics													
0265.A001	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -			1	paste fragment -						-	unglazed both sides
			Totals:	**Household Ceramics**	**1**								
			Totals:	**ST #0123 (N00500/W00200)**	**1**								
ST #0124 (N00500/W00250)													
Household Ceramics													
0266.A000	A - 01	Unidentifiable - Earthenware - paste fragment-red bodied - (099.11) -			1	paste fragment -						-	
0266.A001	A - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-brown - (072.11) -			1	body -						-	glazed both sides
			Totals:	**Household Ceramics**	**2**								
Construction and Waste Material													
0266.C000	A - 01	coal - quarried			15	fragment - - - coal (F16030)		24.8				-	Discarded in lab
			Totals:	**Construction and Waste Material**	**15**			**24.8**					
			Totals:	**ST #0124 (N00500/W00250)**	**17**			**24.8**					
ST #0128 (N00500/W00450)													
Household Ceramics													
0274.A001	A - 01	Unidentifiable - Redware - undecorated-lead glaze-clear - (072.10) -			1	body -						-	worn both side - glazed one side - no opposing surface
			Totals:	**Household Ceramics**	**1**								
			Totals:	**ST #0128 (N00500/W00450)**	**1**								

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Catnum	Stratum	Object - Manufacture	Count	Portion - Color - Material (Code)	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
Area D. East of Masons Creek											
ST #0130 (N00500/W00550)											
Glass Bottles and Commercial Containers											
0278.G001	A - 01	Containers - Unidentifiable - molded	1	- body - glass - Colorless	undec.					-	
		Totals: **Glass Bottles and Commercial Containers**	**1**								
		Totals: **ST #0130 (N00500/W00550)**	**1**								
ST #0131 (N00500/W00650)											
Household Ceramics											
0281.A001	B - 01	Unidentified (sherd-level ident.) - Creamware - undecorated - (007.00) -	1	body -						-	
0281.A002	B - 01	Unidentifiable - Redware - undecorated-lead/mang. glaze-black - (072.12) -	1	body -						-	small glaze speck - glazed one side - no opposing surface
		Totals: **Household Ceramics**	**2**								
Construction and Waste Material											
0281.C000	B - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.4				-	dark orange - Discarded in lab
0281.C000	B - 01	coal - quarried	2	fragment - - - coal (F16030)		0.8				-	Discarded in lab
0281.C004	B - 01	nail - machine cut with cut head	1	head and shank - - - fe (iron) (E15080)						-	
0281.C000	B - 01	brick - unidentifiable	1	fragment - Orange - brick (J20010)		0.2				-	Discarded in lab
		Totals: **Construction and Waste Material**	**5**			**1.4**					
		Totals: **ST #0131 (N00500/W00650)**	**7**			**1.4**					
		Totals: **Area D. East of Masons Creek**	**800**			**1,273.2**					

Appendix D.1 - Artifact Inventory - South Jersey Regional Airport

Catnum	Stratum	Object - Manufacture	Count	Portion - Material (Code)	Color -	Decoration	Weight	Height	Length (IN.)	Width (IN.)	Marks	Comments
		Grand Total:	**1,618**				**2,876.2**					

Appendix D.2 - Inventory of Faunal Remains - South Jersey Regional Airport

Analytical Unit	Unit# - Coordinates	Catalog#	Stratum	Common Name	Identification	Scientific Name	Material	Modification	Count	Weight	Comments
Area C. 28-Bu-62 - East of Masons Creek											
Unit A - Sod and Plowzone											
Unit A - Sod and Plowzone	EU #0001 (N00753/W00497)	1004.F001	B-01	Eastern Oyster	valve fragment	Crassostrea virginica	shell (I19040)		1	3.0	discarded in lab
Unit A - Sod and Plowzone	EU #0003 (N00753/W00447)	1003.F001	B-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	0.6	worn - discarded in lab
Unit A - Sod and Plowzone	EU #0004 (N00753/W00297)	1017.F001	B-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	0.6	discarded in lab
Unit A - Sod and Plowzone	EU #0005 (N00753/W00272)	1018.F001	B-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	3.4	worn - discarded in lab
						Totals:	**Unit A - Sod and Plowzone**		**4**	**7.6**	
						Totals:	**Area C. 28-Bu-62 - East of Masons Creek**		**4**	**7.6**	
Area C. East of Masons Creek											
Unit C - Recent fill and Unassigned											
Unit C - Recent fill and Unassigned	ST #0217 (N00650/W00600)	0471.F001	A-01	Northern Quahog (Hard Shell Clam)	valve with umbo fragment	Mercenaria mercenaria	shell (I19040)		1	4.5	discarded in lab
						Totals:	**Unit C - Recent fill and Unassigned**		**1**	**4.5**	
						Totals:	**Area C. East of Masons Creek**		**1**	**4.5**	
Area D. East of Masons Creek											
Unit C - Recent fill and Unassigned											
Unit C - Recent fill and Unassigned	ST #0012 (N00200/W00075)	0028.F001	A-01	unidentified large mammal	unidentified fragment		faunal (A11030)	calcined	1	0.3	

Appendix D.2 - Inventory of Faunal Remains - South Jersey Regional Airport

Analytical Unit	Unit# - Coordinates	Catalog#	Stratum	Common Name	Identification	Scientific Name	Material	Modification	Count	Weight	Comments
Area D. East of Masons Creek											
Unit C - Recent fill and Unassigned											
Unit C - Recent fill and Unassigned	ST #0041 (N00275/W0 0600)	0101.F00(	A-01	Northern Quahog (Hard Shell Clam)	valve with umbo fragment	Mercenaria mercenaria	shell (I19040)		5	2.0	discarded in lab
Unit C - Recent fill and Unassigned	ST #0049 (N00300/W0 0350)	0119.F001	A-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		2	1.2	1 burnt - discarded in lab
Unit C - Recent fill and Unassigned	ST #0049 (N00300/W0 0350)	0120.F001	B-01	Northern Quahog (Hard Shell Clam)	valve with umbo fragment	Mercenaria mercenaria	shell (I19040)		1	5.7	discarded in lab
Unit C - Recent fill and Unassigned	ST #0049 (N00300/W0 0350)	0120.F002	B-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		5	7.3	discared in lab
Unit C - Recent fill and Unassigned	ST #0050 (N00300/W0 0400)	0122.F001	A-01	-	unidentified fragment	- -	faunal (A11030)	calcined	1	3.2	
Unit C - Recent fill and Unassigned	ST #0054 (N00300/W0 0575)	0134.F00(	A-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	0.5	eroded both sides
Unit C - Recent fill and Unassigned	ST #0055 (N00300/W0 0600)	0137.F001	B-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	0.5	discarded in lab
Unit C - Recent fill and Unassigned	ST #0064 (N00350/W0 0350)	0156.F001	A-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	1.1	worn - discarded in lab
Unit C - Recent fill and Unassigned	ST #0065 (N00350/W0 0400)	0158.F001	A-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	0.5	eroded - discarded in lab
Unit C - Recent fill and Unassigned	ST #0079 (N00400/W0 0450)	0186.F001	A-01	Northern Quahog (Hard Shell Clam)	valve fragment	Mercenaria mercenaria	shell (I19040)		1	2.1	worn - discarded in lab
Unit C - Recent fill and Unassigned	ST #0093 (N00450/W0 0200)	0215.F001	A-01	Eastern Oyster	valve fragment	Crassostrea virginica	shell (I19040)		8	2.7	discarded in lab

Appendix D.2 - Inventory of Faunal Remains - South Jersey Regional Airport

Analytical Unit	Unit# - Coordinates	Catalog#	Stratum	Common Name	Identification	Scientific Name	Material	Modification	Count	Weight	Comments
Area D. East of Masons Creek											
						Totals:		**Unit C - Recent fill and Unassigned**	**28**	**27.1**	
						Totals:		**Area D. East of Masons Creek**	**28**	**27.1**	
						Totals:		**Grand Total:**	**33**	**39.2**	

APPENDIX E

New Jersey State Museum Site Registration Form Addendum

NEW JERSEY STATE MUSEUM
ARCHAEOLOGICAL SITE REGISTRATION PROGRAM
BUREAU OF ARCHAEOLOGY AND ETHNOLOGY
P.O. BOX 530, TRENTON, N.J. 08625-0530
Phone (609) 292-8594; Fax (609) 292-7636

Site Name: Airpark-N (a.k.a. Adamski)

SITE #: ADDENDUM information for 28-Bu-62

☒ Check this box if you prefer to have this site information restricted to professional archaeologists, academics and environmental researchers conducting project background research. If so, this form will be considered donated information according to New Jersey State Law.

NJ State Atlas Coordinates:

USGS 7.5 Minute Series Quad.: Mt. Holly
State Plane Coordinates (required): Easting 395,229.19, Northing 404,531.80
UTM Coordinates (required): Easting 513204.9, Northing 4421502.8

County: Burlington **Township:** Lumberton

Location (descriptive): North of runway at South Jersey Regional Airport

Period of Site: Archaic

Cultural Affiliation(s) (if known):

Owner's (Tenant's) Name: South Jersey Regional Airport
Address Stacey Haines Road, Lumberton, NJ
Phone:
Attitude Toward Preservation: Controls for site protection in place.

Surface Features: grassy field bounded by chain-link fence on north side

Prominent Landmarks: South Jersey Regional Airport

Vegetation Cover: mowed grasses

Nearest Water Source: Masons Creek **Distance:** 500 ft.

Soil Type: Holmdel fine sandy loam, 0-2% slopes **Erosion:**

Stratified (if known): plow zone underlain by subsoil; some material found in subsoil

Threat of Destruction (if known): improvements to airport

Previous Work and References (list below):

	Name	Date	Reference (n/a if unpublished)
1.	ISS	1938	Cross 1941 Vol. 1; ISS site forms
2.	NJSM Site Form	1984	Surveyed by J. Arsenault
3.			

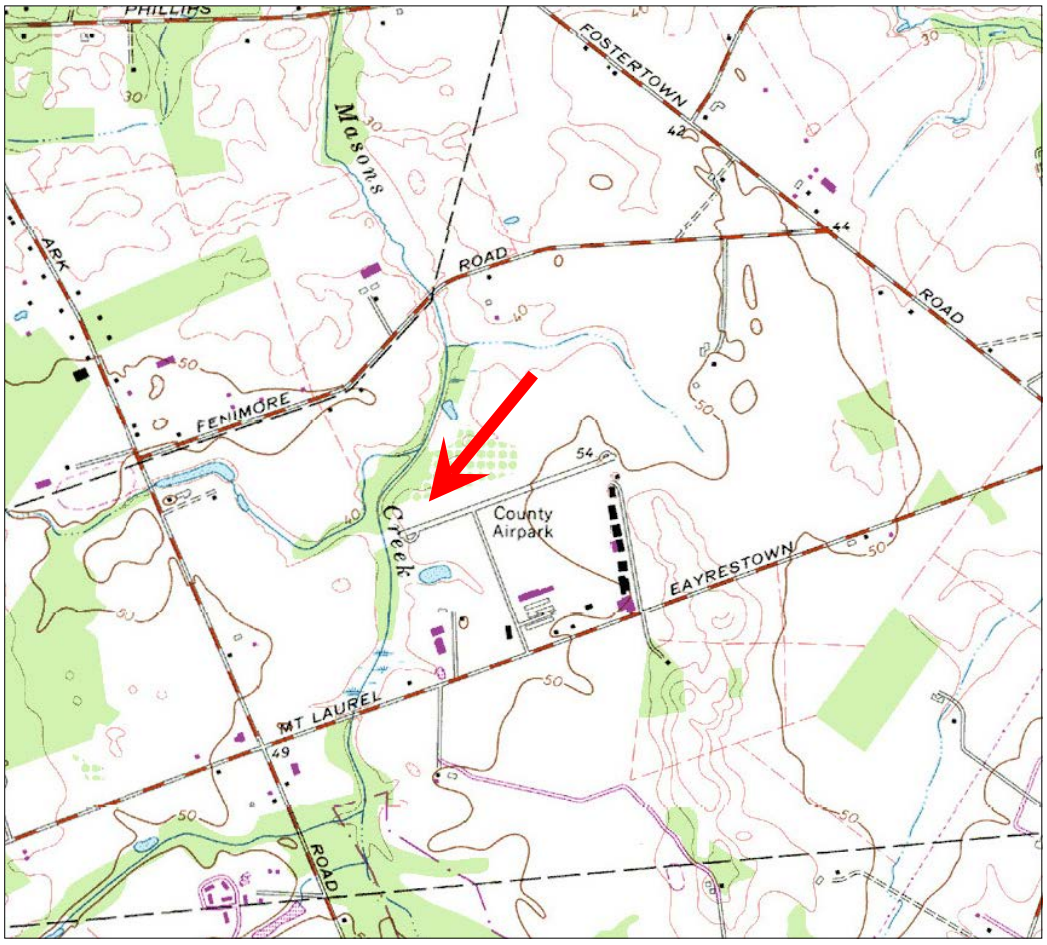
Collections:

	Name	Date	Collection Stored	Previous Designation
1.	NV5	2017	NV5 temporarily – to be transferred to NJDOT	

Sketch Map of the Site:

Indicate the chief topological features, such as streams, swamps, shorelines, and elevations (approximate). Also show buildings and roads. Indicate the site location by enclosing the site area with a dotted line. Use a scale (approximate) to indicate distance and dimensions.

North



Scale: 1" = 2,000'

Observations, Remarks, or Recommendations:

Testing for a runway expansion project at the South Jersey Regional Airport identified a likely archaic camp site that is interpreted as a portion of previously-registered site 28-Bu-62. Points from the excavation units include 2 Poplar Island/Schulkill types.

SEE ATTACHED MAP SHOWING SITE AREA IDENTIFIED IN THIS TESTING

SEE ATTACHED PHOTOGRAPH OF ARTIFACTS

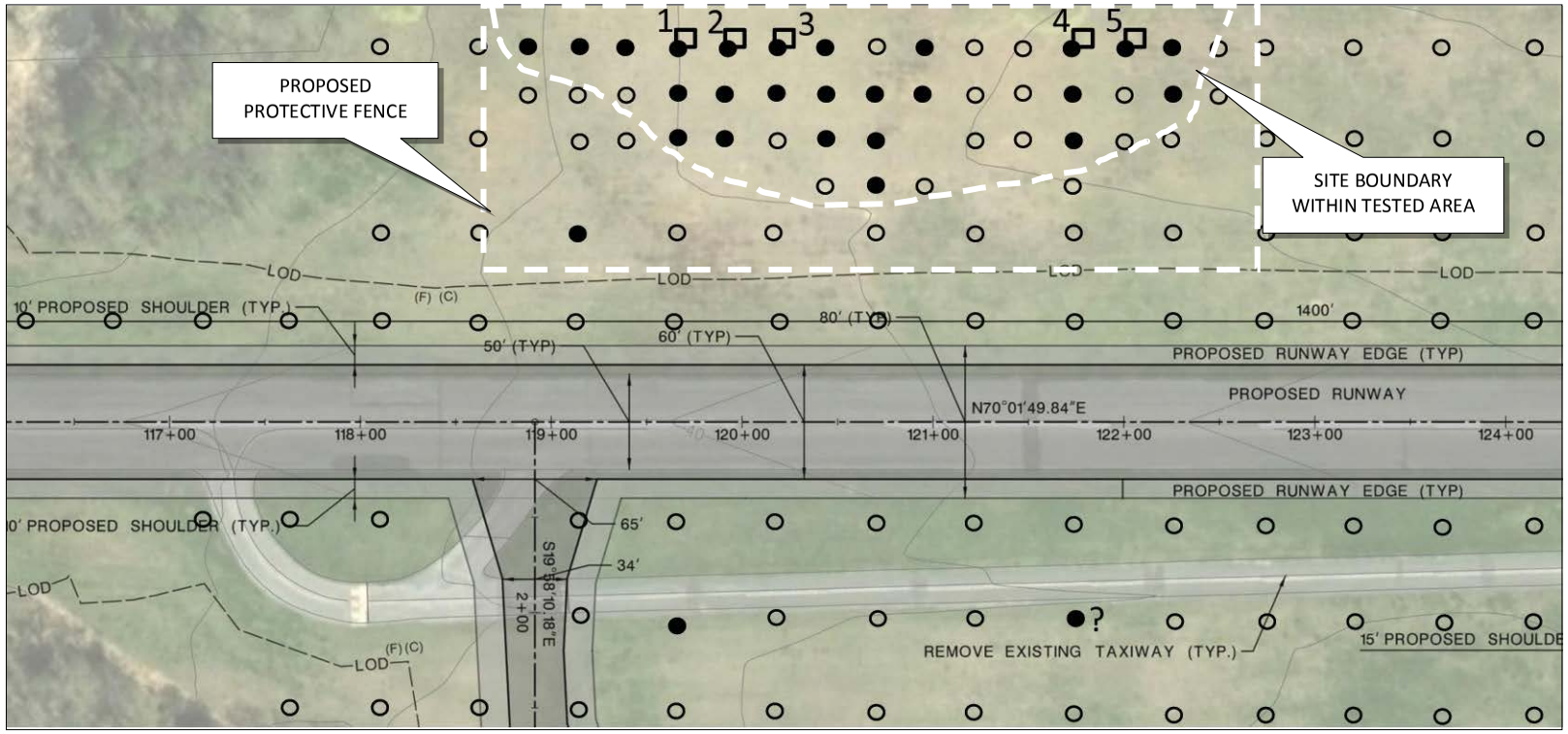
Recorder's Name (Company): Leonard G. Bianchi (NV5)

Address: 7 Campus Drive, Parsippany, NJ

Phone: 973-946-5610

Date Recorder at Site: Sept-Oct 2017

Revised 2007



KEY (TEST UNITS NOT TO SCALE):

● SHOVEL TEST POSITIVE
FOR PRE-CONTACT ARTIFACTS

○ SHOVEL TEST NEGATIVE
FOR PRE-CONTACT ARTIFACTS

☐ 3' x 3' EXCAVATION UNIT

Boundary of identified site (portion of 28-Bu-62) and proposed fencing shown on draft airport expansion project plan.

Artifacts from testing at South Jersey Regional Airport

APPENDIX F

Resumes

LEONARD G. BIANCHI

Principal Archaeologist

Education M.A., Anthropology, 1996, New York University (Thesis: "The Archaeology of the Burrowes Mansion, Matawan, NJ"
B.A., Geography and Anthropology, 1974, Rutgers University

Memberships Society for Historical Archaeology
National Trust for Historic Preservation
Society for Industrial Archaeology; Society for Historical Archaeology
Council for Northeast Historical Archaeology
New Jersey Historical Society
Preservation New Jersey
Archaeological Society of New Jersey
Society for Post-Medieval Archaeology
Matawan Historical Society

Mr. Bianchi has more than 40 years of experience as an archaeologist in the cultural resource management field. His work experience includes:

NJ Turnpike Authority Facilities Improvement Program, Parkway South Maintenance District - Directed field and lab staff and prepared report for project with site locations in Monmouth, Ocean, Burlington, Atlantic, and Cape May Counties.

Route 8 Northbound Temporary Bypass, Waterbury, CT, HNTB Corporation for CT DOT
Directed archaeological field and lab staff and prepared report for Phase I/II survey of 19th century residential site.

Waterbury Naugatuck River Greenway Phase I, City of Waterbury.
Conducted Phase I/II survey and prepared report for proposed Greenway alignment. Investigated Pre-Contact site located on the Naugatuck River and prepared plan for data recovery.

Waterbury Active Transportation and Economic Resurgence (W.A.T.E.R.) Project, City of Waterbury
Directed field and laboratory staff for Phase I/II archaeological survey and prepared technical report.

NJ Route 173/Pohatcong River Bridge Replacement, Greenwich Township, Warren County, NJ - Directed field and lab staff and prepared report for this NJDOT bridge project. Responsible for Phase II investigation of project area, including National Register listed and eligible properties.

NJ Route 34 over Edgar Felix Memorial Bikeway Bridge Replacement Project, Wall Township, Monmouth County, NJ - Directed field and lab staff and prepared report for NJDOT bridge project.

NJ Turnpike Authority Garden State Parkway Interchanges 41 and 44 Improvements Project - Field and Laboratory Director for Phase I archaeological survey for interchange project in Atlantic County.

NJ Turnpike Authority Garden State Parkway Interchange 105 Improvements Project - Field and Laboratory Director for Phase I archaeological survey for interchange project in Monmouth County.

NJ Route 36 Highlands Bridge Replacement, Boroughs of Highlands and Sea Bright, NJ (NJDOT) - Director of field and laboratory research for archaeological data recovery.

Routes 1 and 9T Improvements Project, Jersey City, NJ (**NJDOT)** - Principal Archaeologist responsible for field and lab work on all phases of evaluative survey and data recovery of a 19th-century working-class neighborhood.

Route I-280/First Street Improvements Project, Newark, NJ (**NJDOT)** - Principal Archaeologist responsible for field and lab work on all phases of evaluative survey and data recovery of 8 19th-century urban residential sites.

Neshanic Valley Golf Course, Somerset County, NJ - Principal Archaeologist and Director of field and laboratory research for archaeological survey for golf course development, including investigation of early farmstead sites.

NJ Turnpike Authority Seaview Drive Extension, Jersey City Aqueduct Relocation, and New County Road Grade Separation Project, Secaucus, NJ - Director of field and laboratory research for archaeological data recovery of two historic sites, design of mitigation measures related to the Jersey City Water Works Historic District, including documents inventory and research and writing for narrative report.

Route 94/Vernon and Hardyston, NJ - Supervised Phase I/II survey being completed as per the NJDOT procedures manual and all appropriate state and federal regulations (including public involvement responsibilities) for highway project in Sussex County.

NJDOT Archaeological Data Recovery for NJ Route 15/Houses Corner Road Intersection Reconstruction Project - Responsible for management of field work for data recovery mitigation of two farmstead sites at Houses Corner in Sussex County.

NJDOT Phase 1/2 Archaeological Survey for NJ Route 15/Houses Corner Road Intersection Reconstruction Project - Responsible for management of archaeological fieldwork completed for project at Houses Corner in Sussex County.

NJDOT General Environmental Task Order Agreement, Northern NJ - Responsible for the supervision of archaeological field work and laboratory activities for several projects authorized under this agreement.

NJDOT Batch Levels of Action Assessments, Northern NJ - Responsible for the supervision of archaeological field work and laboratory activities for eight LOAAs for bridge replacement projects.

Routes 1 and 9T Over St. Paul's Avenue and Conrail, Jersey City, NJ - For project involving construction of a new viaduct and ramps on a new alignment and associated highway work, responsible for assessment of archaeological potential of the project area.

NJDOT Interstate Route 280/Newark Highway Access Feasibility Study, Newark, NJ - Responsible for archaeological field work for large-scale feasibility study completed within a densely developed section of Newark.

NJ Turnpike Pennsylvania Extension/Route 130 Interchange Project, Florence, NJ - Responsible for supervision of archaeological fieldwork and laboratory activities for major interchange improvement project in rural Burlington County.

NJ Turnpike Authority Facilities Improvement Program, Parkway South Maintenance District - Responsible for supervision of archaeological field and laboratory work and report preparation for project with site locations in Monmouth, Ocean, Burlington, Atlantic, and Cape May Counties.

Mansion Ridge Country Club Development, Monroe, NY - Principal Archaeologist and Director of field and laboratory research for archaeological survey of early farmstead sites for major environmental compliance project associated with residential and golf development in Orange County.

Prior to joining RBA, Mr. Bianchi worked as Senior Archaeologist for the Rutgers University Center for Public Archaeology, New Brunswick, NJ, and as a Consultant in Archaeology for a number of clients, including the New York University Department of Anthropology, the South Street Seaport Museum, TAMS Consultants, and Historic Conservation and Interpretation. Additional projects include:

NJDOT Raritan Landing Pre-Data Recovery Archaeological Investigations, Piscataway, NJ - Responsible for supervision of archaeological investigations and laboratory activities designed to provide additional information to facilitate data recovery activities within significant early river port village as part of the Route 18 Extension project.

NJDOT Routes 1&9 Elizabeth River Viaduct Replacement Project, Elizabeth, NJ - Responsible for archaeological investigations associated with large bridge replacement project in urban setting.

NJDOT Route 21 Improvement Project, Passaic County, NJ - Responsible for archaeological investigations associated with large highway project in Clifton and Passaic.

JEAN HOWSON, Ph.D.

Supervising Principal Archaeologist
Cultural Resource Unit

Education Ph.D., Anthropology, 1995, New York University
M.A., Anthropology, 1987, New York University
B.A., Anthropology, 1977, Vassar College

Memberships Society for Historical Archaeology
Council for Northeast Historical Archaeology

Dr. Howson has over 30 years of professional experience as an archaeologist including both consulting and academic teaching positions. Her areas of expertise include cultural resource surveys, archaeological survey and data recovery, historical studies, and National Register of Historic Places nominations. Project experience includes:

NJ Turnpike Authority Facilities Improvement Program, Parkway South Maintenance District - Principal Archaeologist responsible for coordination of field and lab staff, research, and report preparation for project with site locations in Monmouth, Ocean, Burlington, Atlantic, and Cape May Counties.

NJ Route 173/Pohatcong River Bridge Replacement, Greenwich Township, Warren County, NJ - Principal Archaeologist responsible for coordination of field and lab staff, research, and report preparation for this NJDOT bridge project. Responsible for Phase II investigation of project area, including National Register listed and eligible properties.

NJ Route 34 over Edgar Felix Memorial Bikeway Bridge Replacement Project, Wall Township, Monmouth County, NJ - Principal Archaeologist responsible for coordination of field and lab staff, research, and report preparation for NJDOT bridge project.

West Thames Street Pedestrian Bridge Project (NYCEDC) - Principal Archaeologist responsible for cultural resource analysis for lower Manhattan project.

US 1&9T Extension Project (NJDOT) - Principal Archaeologist responsible for Phase I/II investigation of complex urban project area, including numerous transportation-related resources.

Picatinny Arsenal Historic Districts Web Site (Picatinny Arsenal, NJ) - Cultural Resources specialist responsible for research, oral history, design, and content for client-hosted interactive, multimedia web site on 5 National Register eligible historic districts on military installation. Responsible for coordinating SHPO review as part of facilities reduction program of U.S. Army Garrison Picatinny. Recipient of Distinguished Award from the American Council of Engineering Companies, NJ.

Route 8 Northbound Temporary Bypass, Waterbury, CT, HNTB Corporation for CT DOT
Project Manager and Principal Archaeologist for Phase I/II survey of 19th-century residential site; prepared technical report.

Waterbury Naugatuck River Greenway Phase I, City of Waterbury.

Project Manager for Phase I/II survey for Greenway project in Waterbury. Coordinated with the City of Waterbury and Connecticut Department of Transportation. Prepared technical reports for Section 106 compliance.

Waterbury Active Transportation and Economic Resurgence (W.A.T.E.R.) Project, City of Waterbury Project Manager for preparation of Archaeological Assessments for 3 project areas in Waterbury for FHWA compliance with Section 106. Planned and managed subsequent Phase I/II survey. Prepared technical reports. Planned and implemented mitigation measures including video documentation.

Garden State Parkway Interchanges 41 and 44 Improvements Project (NJ Turnpike Authority) - Principal Archaeologist responsible for overall project management, archaeological research, and report preparation for Phase I archaeological and intensive-level architectural survey for this interchange project in Atlantic County.

Garden State Parkway Interchange 105 Improvements Project (NJ Turnpike Authority) - Principal Archaeologist responsible for overall project management, archaeological research, and report preparation for Phase I archaeological and intensive-level architectural survey for this interchange project in Monmouth County.

River Road Path Project (Town of Brookhaven, NY) - Principal Archaeologist responsible for Phase I investigation of bicycle/pedestrian path alignment, including assessment of prehistoric and historic resources.

NJ Route 36 Highlands Bridge Replacement, Boroughs of Highlands and Sea Bright, NJ (NJDOT) - Principal Archaeologist and Project Manager for multi-faceted cultural resources mitigation including archaeological data recovery, public exhibits development, and HABS/HAER recordation.

NJ Route 21 Viaduct Rehabilitation Project, Newark, NJ (NJDOT) - Responsible for sensitivity survey of adjacent portion of Mount Pleasant Cemetery.

Route I-280/NJ Route 21 Interchange Improvements Project, Newark, NJ (NJDOT) - Responsible for Phase I archaeological survey of urban project area.

Neshanic Valley Golf Course, Somerset County, NJ (Somerset County Parks Commission) - Project management for archaeological survey for golf course development, including investigation of early farmstead sites; responsible for development and implementation of mitigation measures including exhibits and preservation easement.

Seaview Drive Extension, Jersey City Aqueduct Relocation, and New County Road Grade Separation Project, Secaucus, NJ (NJ Turnpike Authority) - Project management for archaeological survey of project area and data recovery of two historic sites, design of mitigation measures related to the Jersey City Water Works Historic District, including documents inventory and research and writing for narrative report.

Routes 1 and 9T Improvements Project, Jersey City, NJ (**NJDOT)** - Principal Archaeologist and Project Manager for all phases of evaluative survey and multi-faceted cultural resources mitigation including archaeological data recovery of a 19th-century working-class neighborhood; HABS/HAER recordations; and preparation of a resource package for a documentary on the Pulasky Skyway.

Route I-280/First Street Improvements Project, Newark, NJ (NJDOT) - Principal Archaeologist and Project Manager for cultural resources survey and data recovery for 8 19th-century urban residential sites.

African Burial Ground Project, New York
Archaeological Analysis and Report (Howard University, under contract to General Services Administration, New York District) - Served as Associate Director for Archaeology and co-wrote and edited final report. **Interpretive Media (Amaze Design, under contract to National Park Service)** Subject Matter Expert for design team creating interpretive media for the Visitor's Center at the African Burial Ground National Monument.

APPENDIX G

NJ Historic Preservation Office Bibliography Form

New Jersey Historic Preservation Office Annotated Bibliography Form

MAP CODE:

QUAD SHEET: Mount Holly

COUNTY: Burlington

MUNICIPALITIES: Township of Lumberton

AGENCY: New Jersey Department of Transportation

PROJECT TITLE: South Jersey Regional Airport Widening of Runway 8-26 and Ancillary Improvements

PROJECT NUMBER:

LEVEL OF SURVEY: Phase I/II Archaeological Survey

CULTURAL RESOURCE CONSULTANTS: Leonard G. Bianchi, Jean E. Howson (NV5 Cultural Resource Unit)

TITLE AND DATE OF SURVEY REPORT: Cultural Resource Survey, South Jersey Regional Airport Widening of Runway 8-26 and Ancillary Improvements, Township of Lumberton, Burlington County, New Jersey. February 2018.

PREPARED FOR: New Jersey Department of Transportation

DATE OF SURVEY: September-October 2017

SIZE OF PROJECT AREA: 50 acres

NV5

7 Campus Drive
Suite 300
Parsippany, NJ 07054

Appendix E
Wetland Delineation Report

AECOM

South Jersey Regional Airport
Wetland Delineation Report

Widening of Runway 8-26 and Ancillary Improvements
Lumberton Township, Burlington County

November 22, 2017

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Appendix B - Soils Information
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Acronyms

NJDOT -	New Jersey Department of Transportation
FAA -	Federal Aviation Administration
NJDEP -	New Jersey Department of Environmental Protection
LOI -	Letter of Interpretation
OBL -	Obligate wetland species
FACW -	Facultative wetland species
FAC -	Facultative species
NTCHS -	National Technical Committee for Hydric Soils
NWI -	National Wetlands Inventory
USDA -	United States Department of Agriculture's
PFO -	Palustrine Forested
PSS -	Palustrine Scrub-Shrub
PEM -	Palustrine Emergent
Pf-	Palustrine farmed
NRCS -	Natural Resources Conservation Service
SSURGO -	Soil Survey Geographic
GIS -	Geographic Information System

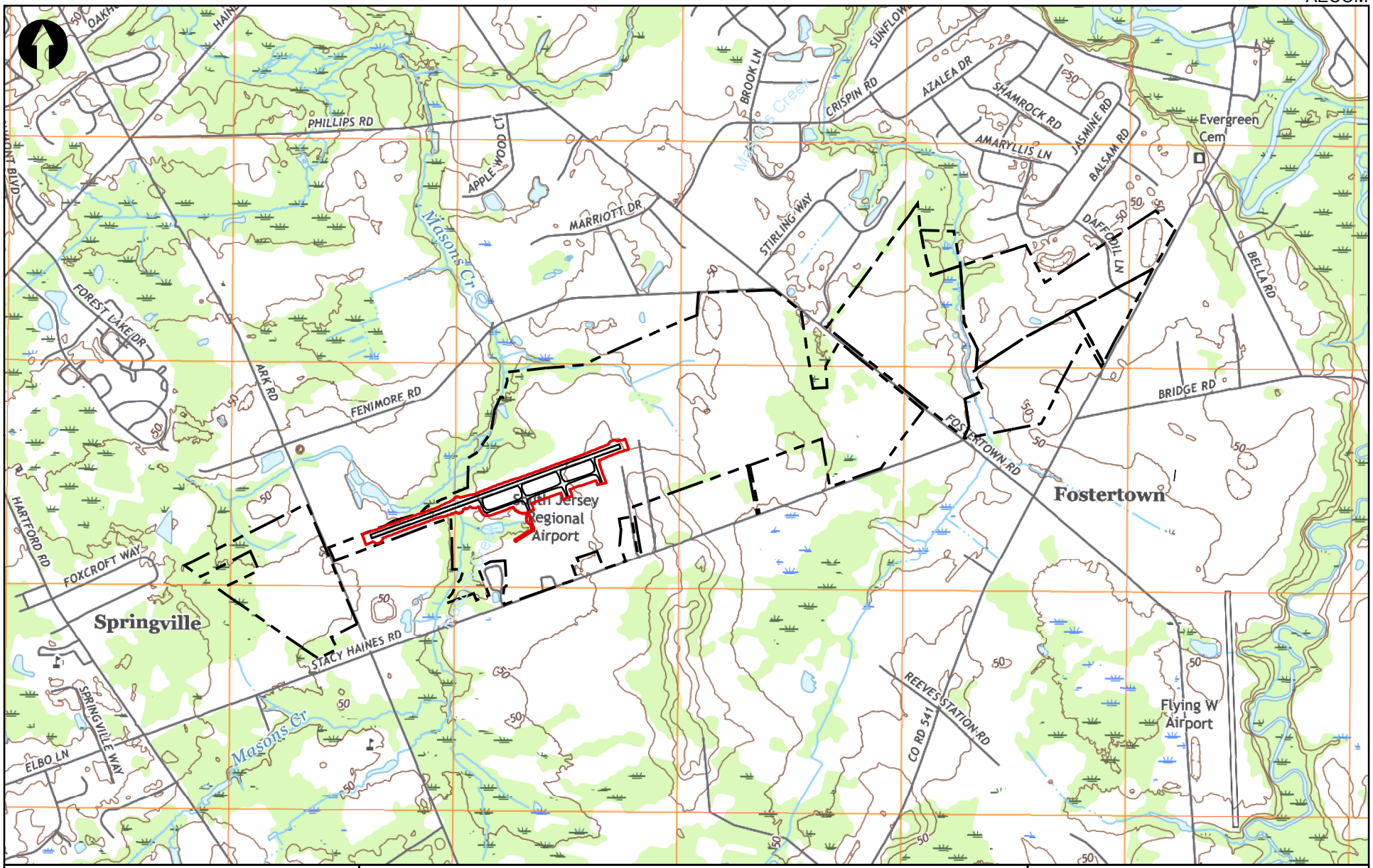
1.0 Introduction

AECOM conducted wetland investigations in areas that may be impacted by the proposed South Jersey Regional Airport Widening of Runway 8-26 project. The project, which is being sponsored by the New Jersey Department of Transportation (NJDOT), is located in Lumberton Township, Burlington County (see Figure 1, Project Location Map). The improvements are proposed within the existing airfield at South Jersey Regional Airport. As currently designed, the proposed improvements include the widening of Runway 08/26's grade from 50 feet to 60 feet; construction of a partial parallel taxiway south of the runway; an increase in the runway to taxiway separation in order to adhere to the Federal Aviation Administration (FAA) design standards; and replacement of the existing (five, 48"CMP) runway crossing of Masons Creek, with a new three-sided rigid frame structure. The project area is located in the Rancocas Creek South Branch (Below Route 38) sub-watershed, the South Branch Rancocas Creek (Below Bobby's Run) watershed, and the Lower Delaware water region (Watershed Management Area #19).

2.0 Purpose

This study has been prepared for the New Jersey Department of Environmental Protection's (NJDEP) informal review and concurrence with the upper wetland boundary and anticipated resource value classification, as well as to document and describe the wetland resources within the project area. Information from this document will be utilized in future freshwater wetland permit applications and/or wetland mitigation proposals, as well as in an Environmental Assessment that is being prepared.

It is emphasized that formal verification of the upper wetland boundary and the designation of resource value classifications can only be accomplished through a formal letter of interpretation (LOI) application or during review of freshwater wetlands permit application. Any opinion provided by the NJDEP based on their review of this document would be non-binding and subject to change based on subsequent review of an LOI or permit application.



Source: Mount Holly USGS US Topographic 7.5' quadrangle

Figure 1

3.0 Methodology

In accordance with the Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A *et seq*.), freshwater wetlands were identified and delineated using the three-parameter approach (soils, hydrology, and vegetation) enumerated in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*, 1989 ("Federal Manual"). Under the three-parameter approach, the legal definition of wetlands is satisfied when the following conditions are met:

1. Hydrophytic Vegetation - More than 50 percent of the dominant species from all strata are obligate wetland (OBL), facultative wetland (FACW) and/or facultative (FAC) species, under normal circumstances. When a plant community has less than or equal to 50% of the dominant species from all strata represented by OBL, FACW and/or FAC species, but hydric soils and wetland hydrology are present, the area is considered to have hydrophytic vegetation.

2. Hydric Soils - An area has hydric soils when the National Technical Committee for Hydric Soils (NTCHS) criteria has been met.

3. Wetland Hydrology – An area has wetland hydrology when saturated to the surface or inundated at some point in time during an average rainfall year under conditions defined in Section 2.9 of the *Federal Manual*.

Field indicators as detailed in the *Federal Manual* and other sources provide direct and indirect evidence for determining whether or not each of the three criteria is met. Under certain "disturbed area" and "problem area" conditions, wetlands may be present without positive indicators for all three parameters.

Prior to performance of field investigations, several standard data sources were reviewed to determine probable wetland locations and their approximate extent throughout the project area. The sources reviewed included the following:

- U.S.G.S. 7.5' Mount Holly Topographic Quadrangle (U.S.G.S., 2016)
- NJDEP Freshwater Wetlands GIS Data (NJDEP, 2012)
- National Wetland Inventory (NWI) (USFWS, 2017)
- Soil Survey of Burlington County (USDA SCS, 1971)
- Web Soil Survey (USDA NRCS, 2017)
- State Soil Data Access (SDA) Hydric Soils List- New Jersey (NRCS, 2017)
- Priority Wetlands for the State of New Jersey (USEPA, 1994)
- Past wetland delineations for the South Jersey Regional Airport:
    - *South Jersey Regional Airport Wetland Delineation Report* (1999) prepared by Clough, Harbour & Associates LLP

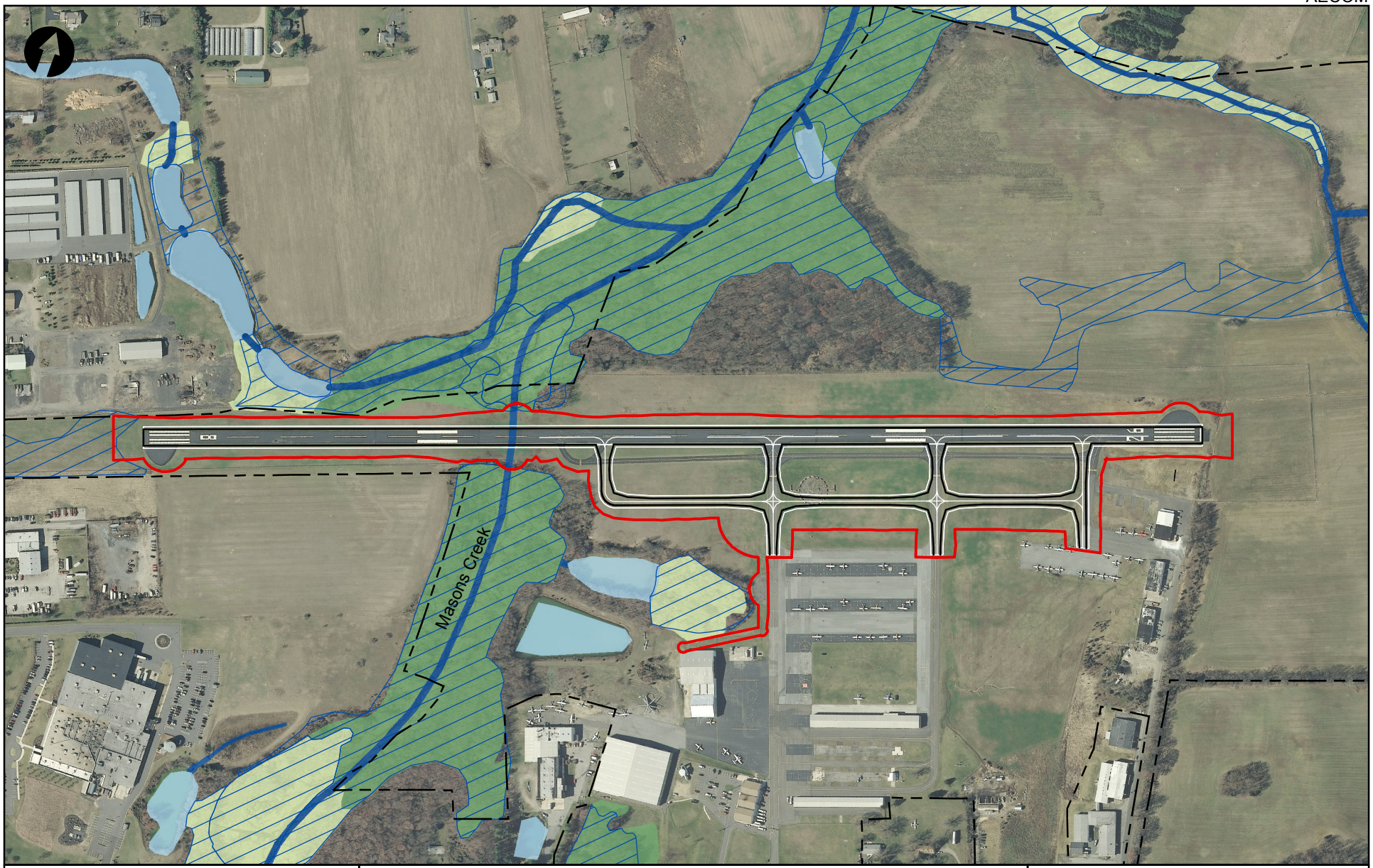
- *South Jersey Regional Airport Runway 08/26 Obstruction Removal Project Wetland Delineation* (2015) prepared by Amy S. Greene Environmental Consultants

Field investigations were conducted in March, April and June of 2017. Wetlands were generally identified and delineated utilizing the Routine Onsite Determination Method – Plant Community Assessment Procedure where hydrophytic vegetation was present, specifically around the vegetated waterways associated with Masons Creek. In the maintained lawn areas, it was determined that the areas were disturbed and the Routine Onsite Determination Method- Hydric Soil Assessment Procedure was utilized in combination with the Disturbed Area and Problem Area Wetland Determination Procedures as specified in the *Federal Manual*.

The wetland delineation followed NJDEP's interpretation of the 1989 *Federal Manual* which considers areas having hydric soils as presumed wetlands, even if these areas lack hydrophytic vegetation and current evidence of hydrology. In New Jersey, these areas are typically referred to as modified agricultural wetlands, and are often agricultural in nature, but may include former agricultural lands which are presently covered by lawns or other areas of maintained vegetation or areas that have been drained by ditches or other means. These modified agricultural wetlands in the project area are all considered disturbed areas pursuant to the *Federal Manual* as they have been altered in the past due to various human activities (plowing, filling, airfield and drainage construction), and are currently being altered through consistent mowing. These types of wetlands are common within the project area, thus the delineation often relied heavily on hydric soils as indicators of wetlands.

Wetland and nonwetland areas were initially identified based on representative plant communities and obvious hydrologic and topographic indicators. The delineation then ensued through characterization of vegetation, soils and hydrology, with pertinent observations on the three mandatory criteria being recorded on Wetland Data Forms, which have been included in Appendix A. The NJDEP and U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) wetlands mapping are presented in Figure 2. The associated FEMA Flood Hazard Area for Masons Creek is presented in Figure 3. United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) soils mapping is presented in Figure 4.

Vegetative communities were identified and the percent cover for each species was visually estimated. Hydrophytic vegetation was considered to be present if more than 50 percent of the dominant plants in an area had wetland indicator statuses of FAC, FACW, or OBL as defined in the *National List of Plant Species that Occur in Wetlands: New Jersey* (Reed, 1988) and the USDA NRCS Plant Database *Wetland Indicator Status Search*.

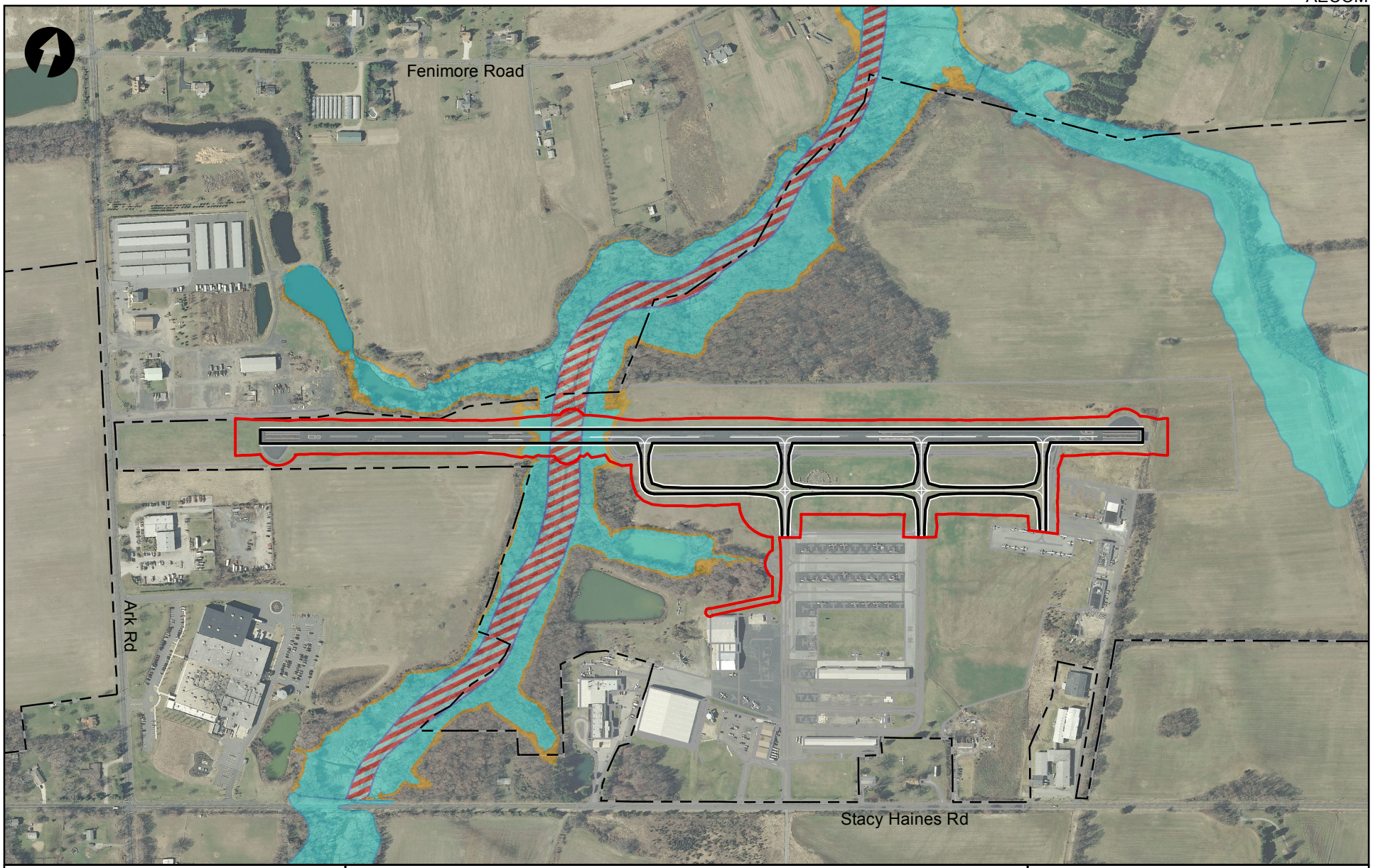


NJDEP and NWI Wetlands

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: NJDEP GIS Data and NWI GIS Data

Figure 2



600 0 600
Feet

Legend

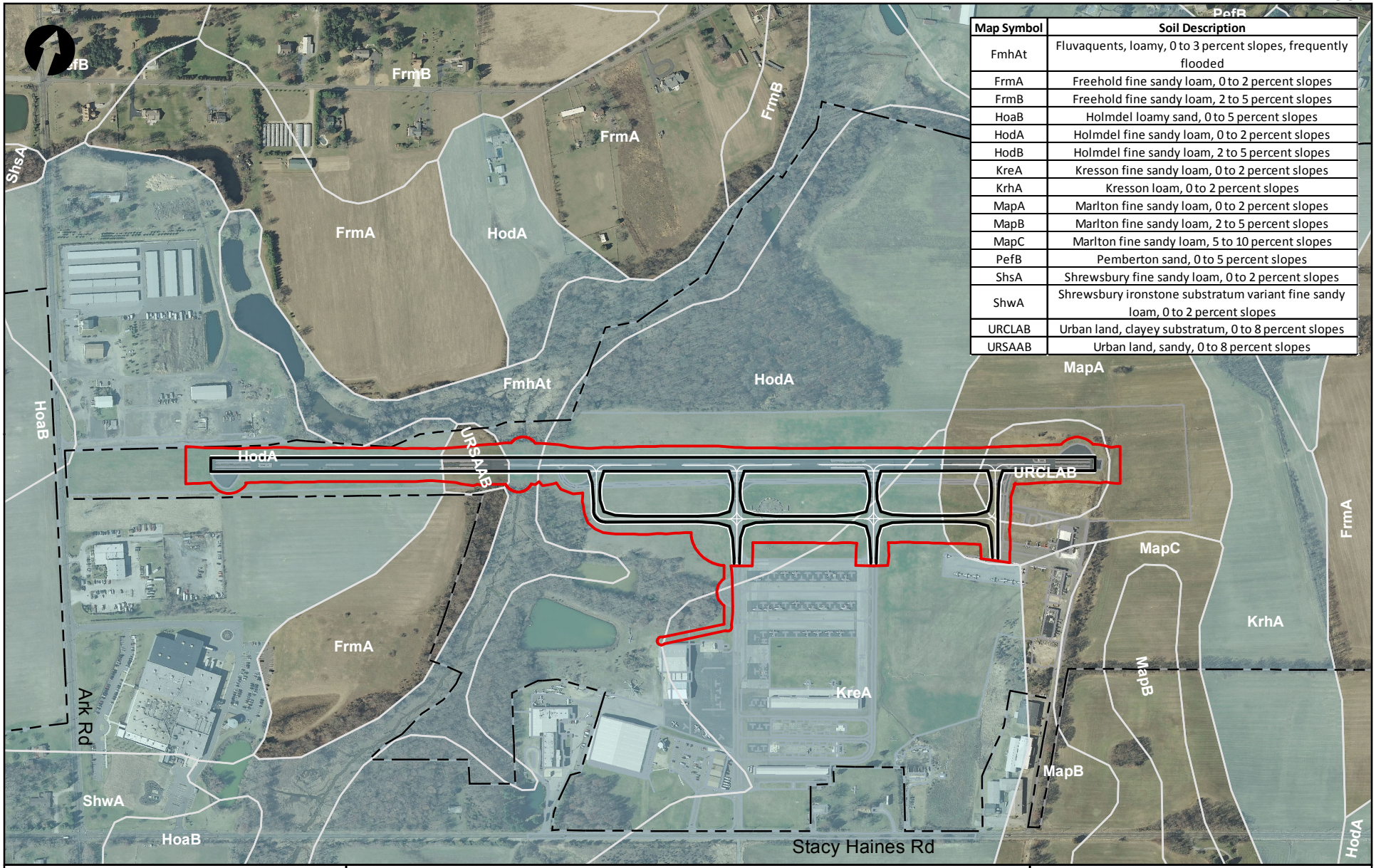
- Project Area
- Airport Property
- FEMA 100-Year Floodplain
- FEMA 500-Year Floodplain
- FEMA Floodway

FEMA Floodplains

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: FEMA Preliminary National Flood Hazard Layer for Burlington County

Figure 3



Map Symbol	Soil Description
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded
FrmA	Freehold fine sandy loam, 0 to 2 percent slopes
FrmB	Freehold fine sandy loam, 2 to 5 percent slopes
HoaB	Holmdel loamy sand, 0 to 5 percent slopes
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes
HodB	Holmdel fine sandy loam, 2 to 5 percent slopes
KreA	Kresson fine sandy loam, 0 to 2 percent slopes
KrhA	Kresson loam, 0 to 2 percent slopes
MapA	Marlton fine sandy loam, 0 to 2 percent slopes
MapB	Marlton fine sandy loam, 2 to 5 percent slopes
MapC	Marlton fine sandy loam, 5 to 10 percent slopes
PefB	Pemberton sand, 0 to 5 percent slopes
ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes
ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes
URCLAB	Urban land, clayey substratum, 0 to 8 percent slopes
URSAAB	Urban land, sandy, 0 to 8 percent slopes

600 0 600

Feet

Legend

- Project Area
- Airport Property
- Hydric Soils

Soils Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: USDA NRCS Web Soil Survey 2017

Figure 4

Soils were investigated by advancing borings (generally to 24-inches) with a hand auger. Soils were compared against *Munsell Soil Color Charts* (X-Rite) to determine hue, value and chroma. Soil matrix color, soil texture, presence and characteristics of redoximorphic features and presence of odor were recorded in accordance with the *Field Indicators of Hydric Soils in the United States* and the *Field Book for Describing and Sampling Soils* (USDA NRCS).

Hydrologic indicators and human alterations were also evaluated in the vicinity of the borings, as well as throughout the respective wetland areas. Although sometimes unreliable, there are many indicators of wetlands hydrology. Soil saturation, oxidized root channels, evidence of inundation, and presence of hydric soils and hydrophytic vegetation were some of the indicators used as positive evidence of wetland hydrology.

The upper wetland boundary was demarcated in the field with survey ribbon and each wetland area was classified according to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*., 1979).

Wetland functions and values were evaluated utilizing *The Highway Methodology Workbook Supplement – Wetland Functions and Values: A Descriptive Approach* (USACE, 1995) as a guideline. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values, and wetland values are based on human judgment of the worth, merit, quality, or importance attributed to its functions.

The Descriptive Approach considers the following eight functions and five values:

Functions:

- Groundwater Recharge/Discharge
- Floodflow Alteration (Storage and Desynchronization)
- Fish and Shellfish Habitat
- Sediment/Toxicant/Pathogen Retention
- Nutrient Removal/Retention/Transformation
- Production Export (Nutrient)
- Sediment/Shoreline Stabilization
- Wildlife Habitat

Values

- Recreation
- Educational/Scientific Value
- Uniqueness/Heritage
- Visual Quality/Aesthetics
- Threatened or Endangered Species Habitat

Because many wetland areas will perform most functions to some degree, "principal functions and values" are identified which are considered to be important physical components of the wetland areas and/or are considered of special value to society from a local, regional or national perspective.

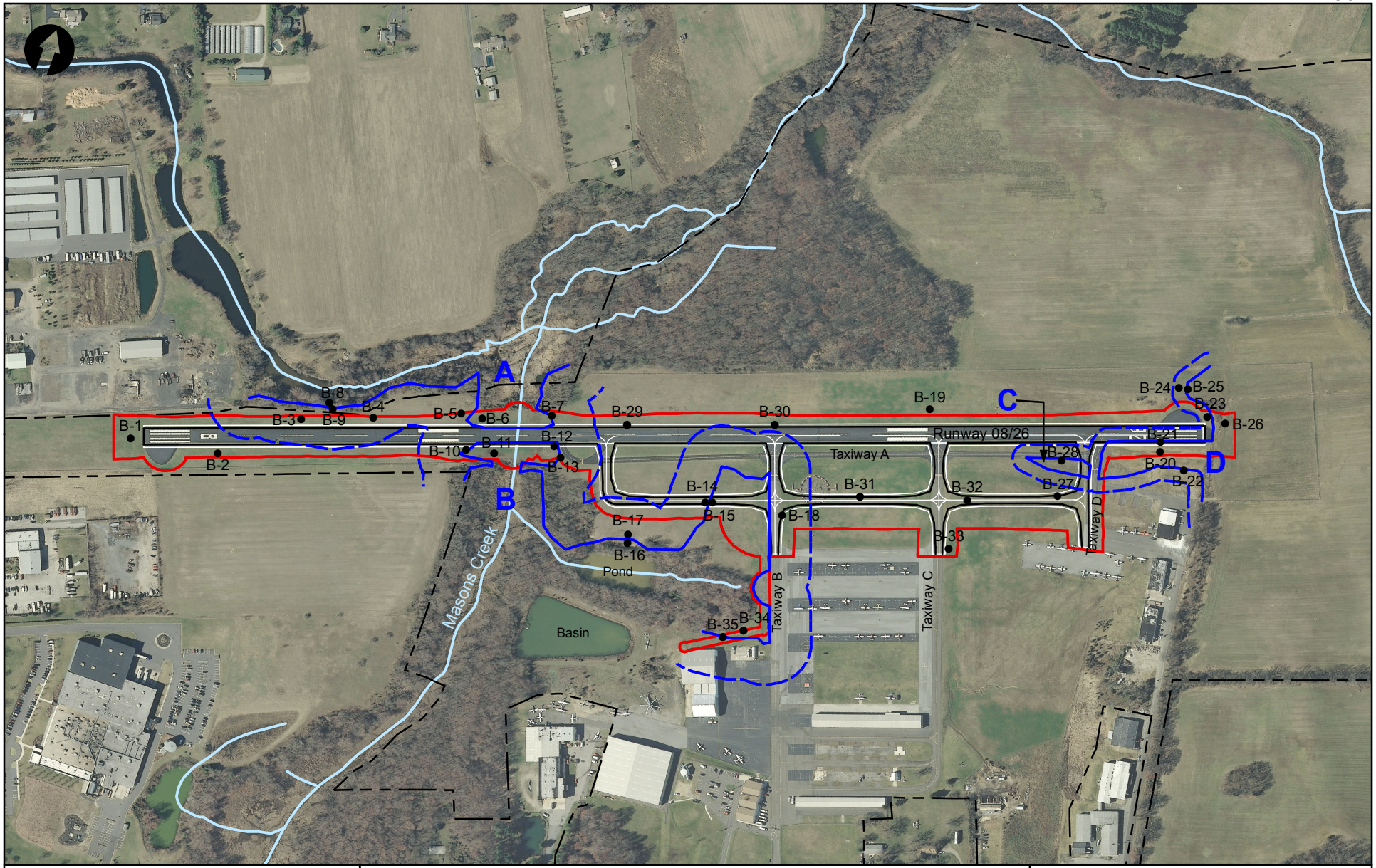
4.0 Results

As shown in Figure 5, four wetland areas designated as Wetland A through Wetland D were identified in the project area. Most of these wetland areas are associated with Masons Creek and its multiple onsite tributaries. Wetlands A and B are associated with Masons Creek, which flows perpendicular to and beneath the runway. Wetland A is associated with unnamed tributaries north of the runway, while Wetland B is associated with unnamed tributaries to the south of the runway, both of which contain multiple ponds. Wetland C and D are associated with unnamed tributaries east of the runway. Where hydric soils were observed, additional areas beyond the immediate stream corridors were delineated and mapped as wetlands (see Figure 5, Delineated Wetlands). Wetlands associated with Masons Creek and its tributaries within the vicinity of the project area are not considered United States Environmental Protection Agency (USEPA) Priority Wetlands.

The project area contains wetlands classified as Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Emergent (PEM), and Palustrine farmed (Pf) according to the U.S. Fish and Wildlife Service's *Wetland Classification System* (Cowardin *et al*., 1979). The palustrine wetland system includes all non-tidal wetlands dominated by trees, shrubs, and emergent vegetation, as well as certain wetlands that occur in tidal areas, depending on salinity levels. Forested and scrub-shrub wetlands are dominated by woody vegetation (generally greater than 20 feet tall in forested communities and less than 20 feet in scrub-shrub communities), while emergent wetlands are characterized by erect, rooted, herbaceous plants. Palustrine farmed wetlands usually contain crops; however, in the case of the study area, these modified agricultural wetlands predominantly contain maintained lawn vegetation.

Dominant vegetation observed in the PFO wetlands on the project site include: red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), sweetgum (*Liquidambar styraciflua*), black willow (*Salix nigra*), pin oak (*Quercus palustris*), silky dogwood (*Cornus amomum*), musclewood (*Carpinus caroliniana*) and black gum (*Nyssa sylvatica*). Dominant shrubs and vines include southern arrowwood (*Viburnum dentatum*), spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), Japanese honeysuckle (*Lonicera japonica*), and poison ivy (*Toxicodendron radicans*).

Herbaceous vegetation in the PFO wetlands is dominated by skunk cabbage (*Symplocarpus foetidus*), Japanese stiltgrass (*Microstegium vimineum*), sensitive fern (*Onoclea sensibilis*) and cinnamon fern (*Osmunda cinnamomea*).



Delineated Wetlands

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

Source: 2017 Wetland Delineation and Survey Data

Figure 5

PEM wetland areas line the immediate banks of Masons Creek. The areas around Masons Creek are dominated by nearly monotypic stands of Japanese stiltgrass and/or reed canary grass (*Phalaris arundinacea*) with localized concentrations of common reed (*Phragmites australis*), green bulrush (*Scirpus atrovirens*), false nettle (*Boehmeria cylindrica*), skunk cabbage and occasional specimens of speckled alder (*Alnus incana*). PEM wetland areas are also found around the ditch at the eastern end of the runway. This PEM wetland area is dominated by common reed, callery pear saplings (*Pyrus calleryana*), daylily (*Hemerocallis fulva*), bittercress (*Cardamine hirsuta*), dogbane (*Apocynum cannabinum*), soft rush (*Juncus effusus*), and Japanese honeysuckle.

The PSS wetlands occur in relatively small areas between some of the emergent and forested habitats, and are dominated by black willow, speckled alder, arrowwood and silky dogwood, with a mix of herbaceous plants similar to the emergent wetlands.

The Pf wetlands onsite contain vegetation essentially the same as other, non-wetland lawn areas on the airport property and contain various lawn grasses, including tall fescue (*Festuca arundinacea*), ryegrass (*Lolium spp*.), and Kentucky bluegrass (*Poa pratensis*), and a host of forbs such as common dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), English plantain (*Plantago lanceolata*), wild onion (*Allium vineale*), common clover (*Trifolium repens*), chickweed (*Stellaria media*), Canadian white violet (*Viola canadensis*) and others.

The Pf wetland areas within the project site are considered disturbed areas pursuant to the *Federal Manual* which states, "Disturbed area include both wetlands and nonwetlands that have been modified to varying degrees by human activities or by natural events". The Pf wetlands onsite are former agricultural lands which are presently covered by lawns within the airfield. During airfield construction, fill was added in areas around the runway specifically in locations in the vicinity of Masons Creek. Today these modified agricultural wetlands are subject to frequent mowing to maintain the lawn around the facilities, potentially preventing the return of hydrophytic vegetation in those areas with hydric soils. Wetland hydrology has been altered by various drainage systems implemented over the years including ditches and manmade ponds.

Descriptions of the wetland areas, including information on vegetation, soils, hydrologic conditions and functions/values are provided below. Photographs of the wetland areas have been included in Appendix C and additional soils information is included in Appendix B.

Wetland A

Wetland A is confined to the well-defined floodplain of Masons Creek and contains all four types of palustrine wetlands mentioned above. The majority is composed of PFO wetlands with small areas of PEM and PSS wetlands along the banks of Masons Creek and its unnamed tributary to the west. There is also a small area of Pf wetlands located in the maintained lawn area around the culverted section of the stream.

Vegetation

Wetland A is dominated by PFO wetland vegetation around Masons Creek and the unnamed tributary to the west. Bordering the PFO wetlands, mainly around the banks of Masons Creek, are small areas of PSS and PEM wetland vegetation. Wetland A contains a small area of Pf wetlands located between the north edge of the runway and the culvert. Vegetation associated with the PFO, PSS, PEM and Pf wetlands are consistent with the vegetation described previously.

Soils

According to the USDA NRCS Soil Survey Geographic (SSURGO) Database and affiliated Geographic Information System (GIS) mapping, soils in the vicinity of Wetland A are associated mainly with the Fluvaquent series and partially with the Holmdel series and Urban Land. Typical descriptions of these soils are provided below.

Fluvaquents (FmhAt) consist of very deep, poorly and somewhat poorly drained loamy soils on floodplains. They formed in alluvium. Slopes range from 0 to 3 percent. This soil type is listed as hydric by the NTCHS.

Holmdel (HodA) soils consist of very deep, moderately well drained, fine-loamy sands on flats. Slopes range from 0 to 2 percent. This soil type is listed as hydric by the NTCHS and is considered a prime farmland soil in New Jersey by the USDA NRCS.

Urban Land soils (URSAAB) are sandy with 0 to 8 percent slopes. The soil is typically covered in pavement, and underlain by disturbed and natural soil material. Its drainage, hydric soil rating and farmland classification are not determined.

Soils here exhibited conditions generally similar to the Fluvaquent, Holmdel and Urban Lands soils identified by the NRCS. Wetland A soils exhibited various hydric soil field indicators including redoximorphic features, low chroma colors, and organic soils, as documented in the Wetland Data Forms.

Hydrology

Wetland A derives its hydrology from Masons Creek, its unnamed tributary to the west, and associated floodplains. Oxidized root channels, surface saturation and hydric soils were the main hydrologic indicators observed within this wetland area. Wetland A also contains a potential vernal habitat on the east side of Masons Creek and contains multiple ponds associated with its tributary to the west.

Functions and Values

Wetland functions associated with Wetland A include groundwater recharge/discharge, flood-flow alteration, fish and wildlife habitat, and production export due to the presence of prime farmland soils. Values attributed to these wetlands include Uniqueness/Heritage due to the high potential for archaeological resources in the area, and Threatened or Endangered Species Habitat due to potential habitat for bog turtle (*Glyptemys muhlenbergii*) and swamp pink (*Helonias bullata*).

Wetland B

Wetland B is mostly confined to the floodplain of Masons Creek and its tributaries south of the runway; however, there is also a large area of wetlands within the lawn area adjacent to Taxiway B. Like Wetland A, Wetland B contains all four types of palustrine wetlands. A large portion of Wetland B is encompassed by PFO wetlands with small areas of PEM and PSS wetlands along the banks of Masons Creek and its unnamed tributary to the east. There is a section of Pf wetlands located in the maintained lawn area around the culverted section of the stream and a large area of Pf wetlands in the area adjacent to Taxiway A, Taxiway B and the fuel storage area.

Vegetation

Wetland B is dominated by PFO wetland vegetation associated with Masons Creek and its unnamed tributary to the east along with a large portion of Pf wetland vegetation in the maintained lawn areas. Bordering the PFO wetlands are small areas of PSS and PEM wetland vegetation, mainly around the channel banks and pond associated with Masons Creek and its eastern tributary. Vegetation associated with the PFO, PSS, PEM and Pf wetlands are consistent with the vegetation described previously.

Soils

According to the USDA NRCS SSURGO Database and affiliated GIS mapping, soils in the vicinity of Wetland B are associated mainly with the Fluvaquent, the Holmdel, the Kresson and Freehold soil series, and some Urban Land. Typical descriptions of these soils are provided above in relation to Wetland A with the exception of the Freehold and Kresson series below.

Freehold soils (FrmA) consist of very deep, well drained, fine sandy loam soils on flats and low hills, and typically contain glauconite. Slopes range from 0-2 percent. This soil type is considered a prime farmland soil in New Jersey by the USDA NRCS.

Kresson soils (KreA) consist of very deep, somewhat poorly drained, fine sandy loam soils on depressions, flats, drainageways, and low hills. Slopes range from 0-2 percent. This soil type is listed as hydric by the NTCHS, and, when drained, is considered a farmland soil of statewide importance by the USDA NRCS.

Soils here exhibited conditions generally similar to the Holmdel, Fluvaquent, Kresson sand Urban Lands soils identified by the NRCS. Wetland B soils exhibited various hydric soil field indicators including redoxomorphic features, low chroma colors, and iron concentrations as documented in the Wetland Data Forms.

Hydrology

Wetland B derives its hydrology from Masons Creek, the unnamed tributary to the east and the associated floodplain. Due to the condition of the culverts, beaver activity in the area, and the wetland's location on the upstream side of the culvert, Masons Creek within Wetland B is prone to flooding. Water stained leaves, evidence of ponding, oxidized root channels, and hydric soils were the main hydrologic indicators observed within this wetland area. Wetland B contains a large pond in which the unnamed eastern tributary flows through.

Hydrology in the large Pf area adjacent to Taxiway A, Taxiway B and the fuel storage area has been disturbed. This area is effectively drained by a ditch that connects to the tributary to Masons Creek. The nearby constructed stormwater retention basin may have impacted the hydrology of this area as well.

Functions and Values

Wetland functions associated with the Wetland B area, like Wetland A, include groundwater recharge/discharge, flood-flow alteration, fish and wildlife habitat, and production export due to the presence of prime farmland soils in the project area wetlands. Values attributed to these wetlands include Uniqueness/Heritage due to the high potential for archaeological resources in the area, and Threatened or Endangered Species Habitat due to potential habitat for bog turtle and swamp pink.

Wetland C

Wetland C is contained entirely within the maintained lawn area bordering Taxiway A and Taxiway D. Wetland C contains only Pf wetlands.

Vegetation

Wetland C is dominated by Pf wetland vegetation as it is contained entirely within a maintained lawn area adjacent to the existing parallel taxiway and east apron. Vegetation associated with Wetland C is consistent with the vegetation found in the Pf wetland description above.

Soils

According to the USDA NRCS SSURGO Database and affiliated GIS mapping, soils in the vicinity of Wetland C are associated with the Marlton family and Urban Land. Typical descriptions of these soils are provided below.

Marlton soil (MapA) consists of very deep, well drained, fine sandy loam soils on flats, and typically contain glauconite. Slopes range form 0-2 percent. This soil type is considered a prime farmland soil in New Jersey by the USDA NRCS.

Urban Land (URCLAB) in the eastern end of the project area are clayey with 0 to 8 percent slopes. The soil is typically covered in pavement, and underlain by disturbed and natural soil material. Its drainage, hydric soil rating and farmland classification are not determined.

Soils were extremely clayey and exhibited conditions generally similar to the Urban Land soils identified by the NRCS. Marlton soils were not observed within Wetland C. Wetland C soils exhibited various hydric soil field indicators including redoxomorphic features, and low chroma colors, as documented in the Wetland Data Forms.

Hydrology

In the past, Wetland C likely derived its hydrology from the unnamed tributary to Masons Creek to the east. Parts of this floodplain have since been filled for airport construction and drained for agricultural use. As such, current hydrology results from the local geomorphology and runoff from nearby paved areas. The area begins a gradual decline in elevation towards the unnamed tributary to the east. Runoff in this area will settle here due to the slope and adjacent pavement. Hydric soils were the main hydrologic indicator observed within this wetland area. No direct evidence of hydrology was present in this wetland; therefore, hydric soils were used as evidence of wetland hydrology.

Functions and Values

Wetland functions associated with Wetland C include groundwater recharge/discharge. Values attributed to these wetlands include Uniqueness/Heritage due to the high potential for archaeological resources in the area.

Wetland D

Wetland D is located at the eastern end of the runway and includes the lawn area adjacent to Taxiway D. The majority of Wetland D is comprised of Pf wetlands in the maintained lawn space and agricultural field to the east. A small area of PEM wetlands exist along a non-mowed ditch adjacent to the runway end.

Vegetation

Wetland D is dominated by Pf wetland vegetation in the lawn areas and PEM wetland vegetation in the ditch adjacent to the east end of the runway. Vegetation associated with Wetland D is consistent with the vegetation found in the Pf and PEM wetland description above; however, the portion of Wetland D south of the runway and adjacent to Taxiway D is notably lacking vegetative cover.

Soils

According to the USDA NRCS SSURGO Database and affiliated GIS mapping, soils in the vicinity of Wetland D are associated with the Marlton family and Urban Land. Typical descriptions of these soils are provided above in the Wetland C description.

Soils are mainly clayey and exhibited conditions generally similar to the Urban Land soils identified by the NRCS. Marlton soils were not observed. Wetland D soils exhibited various hydric soil field indicators including redoxomorphic features, gleyed soils and low chroma colors as documented in the Wetland Data Forms.

Hydrology

In the past, Wetland D likely derived its hydrology from the unnamed tributary to Masons Creek to the east. Parts of this area have since been filled for airport construction or drained for agricultural use. As such, current hydrology is the result of the local geomorphology and runoff from the adjacent paved areas. The area is adjacent to the built up runway end, contains current agricultural lands and a large ditch. Hydrologic indicators observed within this wetland include surface scouring/eroded sediments, and ponding within the ditch. Where no direct evidence of hydrology was present, hydric soils were used as evidence of wetland hydrology.

Functions and Values

Wetland functions associated with the Wetland D area, like Wetland C, include groundwater recharge/discharge. Values attributed to these wetlands include Uniqueness/Heritage due to the high potential for archaeological resources in the area.

5.0 Conclusions and Regulatory Implications

The four wetland areas identified in the project study area are summarized in *Table 1* below and are depicted on project area mapping in *Figure 5*. These wetland areas are regulated under the NJDEP Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A). Under these rules, freshwater wetlands are classified by resource value. Resource value classifications are designated by the NJDEP and are considered in determining the size of wetland transition areas, evaluating proposals for regulated activities, and determining wetland mitigation requirements.

Based on the conditions observed during several site evaluations; a preliminary review of digital GIS data; the NJDEP *Protocols for the Establishment of Exceptional Resource Value Wetlands* (2004); and site specific information provided by the NJDEP Natural Heritage Program, it is anticipated that Wetlands A and B will have a resource value classification of exceptional with 150-foot transition areas due to the potential for threatened and endangered species in these areas. Wetlands C and D are expected to have an intermediate resource value with 50-foot transition areas. The NJDEP will verify the upper wetland boundary and resource value classification as part of the LOI/permit review process.

Table 1
Summary of Delineated Wetland Areas

Wetland Area	A	B	C	D
Vegetation*	PFO, PSS, PEM & Pf wetland vegetation	PFO, PSS, PEM & Pf wetland vegetation	Pf wetland vegetation	Pf & PEM vegetation Pf wetland area south of runway end lacking vegetation
Soils	FmhAt-Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded, Hydric HodA - Holmdel fine sandy loam, 0 to 2 percent slopes, Hydric, Prime Farmland Soil URSAAB - Urban land, sandy, 0 to 8 percent slopes Hydric Soil Indicators: Redoxomorphic features, low chroma colors, and organic soils	FmhAt- Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded, Hydric HodA - Holmdel fine sandy loam, 0 to 2 percent slopes, Hydric, Prime Farmland Soil KreA - Kresson fine sandy loam, 0-2 percent slopes, Hydric, Farmland soil of Statewide Importance when drained URSAAB Urban land, sandy, 0 to 8 percent slopes Hydric Soil Indicators: Redoxomorphic features, gleyed soils and low chroma colors	URCLAB - Urban land, clayey substratum, 0 to 8 percent slopes Hydric Soil Indicators: Redoxomorphic features, and low chroma colors	URCLAB - Urban land, clayey substratum, 0 to 8 percent slopes Hydric Soil Indicators: Redoxomorphic features, gleyed soils and low chroma colors
Hydrologic Indicators	Oxidized root channels, surface saturation and hydric soils	Water stained leaves, evidence of ponding, oxidized root channels, and hydric soils	Hydric soil presence	Surface scouring/eroded sediments, ponding and Hydric soil presence
Functions and Values	Functions: Groundwater recharge/discharge, flood-flow alteration, fish and wildlife habitat, and production export Values: Uniqueness/Heritage and Threatened or Endangered Species Habitat	Functions: Groundwater recharge/discharge, flood-flow alteration, fish and wildlife habitat, and production export Values: Uniqueness/Heritage and Threatened or Endangered Species Habitat	Functions: Groundwater recharge/discharge Values: Uniqueness/ Heritage	Functions: Groundwater recharge/discharge Values: Uniqueness/ Heritage

*Vegetative community associated with each wetland type is described in Section 4

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Appendix A
Wetland Data Forms

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	March 8, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-1
Remarks: B-1: Upland at the western runway end.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Common blue violet (*Viola sororia*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%							
Remarks: Maintained lawn.							

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION					
Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 18		2.5Y 4/4			Sandy loam
18 - 24		2.5Y 4/4	7.5YR 5/8	5% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS			
	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)
Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.			

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)
Remarks: Hydrology criterion not met.			

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 5, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-2
Remarks: B-2: Upland grassed area south west end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Common blue violet (*Viola sororia*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%							
Remarks: Maintained lawn.							

SOILS

Map unit name: HodA- fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 4		10YR 2/2			Loam
4 - 15		2.5Y 4/3			Sandy loam
15 - 24		2.5Y 5/4	7.5YR 6/8	2% / Prominent	Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No saturation within 24 inches. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 5, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-3
Remarks: B-3: Upland grassed area north west end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Common blue violet (*Viola sororia*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%							
Remarks: Maintained lawn.							

SOILS

Map unit name: HodA- fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Holmdel		
Soil drainage class: Moderately well drained	Field observations confirm mapped type?	Yes	No X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 7		10YR 4/4			Sandy loam
7 - 24		10YR 5/6			Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 5, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-4
Remarks: B-4: Upland grassed area south west end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Common blue violet (*Viola sororia*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA- fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 12		10YR 3/6			Loamy sand
12 - 24		7.5YR 4/6			Loamy sand

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Gravely from 8-12". Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No moisture in 24". Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 11, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-5
Remarks: B-5: Upland grassed area north west side of runway culvert.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Common blue violet (*Viola sororia*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%							
Remarks: Maintained lawn.							

SOILS

Map unit name: URSAAB- sandy, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Not rated		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 2		10YR 4/4			Sandy loam
2 -16		2.5YR 5/6			Loamy sand
16 -24		2.5Y 5/3	10YR 5/8	2% / Prominent	Loamy sand

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Apparent fill material. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 11, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-6
Remarks: B-6: Wetland grassed area north west side of culverted runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.	Common gypsyweed (*Veronica officinalis*)	H	FACU
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 11.1%

Remarks: Maintained lawn.

SOILS

Map unit name: URSAAB- sandy, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Not rated		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 - 2		10YR 2/2			Sandy loam
2 -6		2.5Y 4/3			Sandy loam
6 -12		2.5Y 4/2	7.5YR 4/6	7% / Prominent	Sandy loam
12-20		2.5Y 4/2	7.5YR 4/6	10-15% / Prominent	Sandy loam
20-24		2.5Y 4/2	7.5YR 4/6	10-15% / Prominent	Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Depleted matrix. Field observations not consistent with map unit description.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data	X	Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available	X	Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	10"		Other (describe in remarks)

Remarks: Wetland hydrology observed.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydrophytic vegetation is not present due to regular mowing; however, both hydric soils and wetland hydrology are present. Location is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 11, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-7
Remarks: B-7: Upland area north east of culverted runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn area.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0 -10		2.5Y 4/4			Sandy loam
10 -18		10YR 3/3	5YR 3/4	5% / Distinct	Sandy loam

Refusal at 18". Gravel and Brick found from 10-18".

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Apparent fill material. Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 11, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes	X	No		Community ID:	
Is the site significantly disturbed?		Yes		No	X	Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-8
Remarks: B-8: Wetland in forested area near pond at Northwest end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Skunk cabbage (*Symplocarpus foetidus*)	H	OBL	9.	Tussock sedge (*Carex stricta*)	H	OBL
2.	Roundleaf greenbriar (*Smilax rotundifolia*)	V	FAC	10.			
3.	Cinnamon fern (*Osmunda cinnamomea*)	H	FACW	11.			
4.	Stilt grass (*Microstegium vimineum*)	H	FAC	12.			
5.	Arrowwood (*Viburnum dentatum*)	S	FAC	13.			
6.	Red maple (*Acer rubrum*)	T	FAC	14.			
7.	Soft rush (*Juncus effusus*)	H	OBL	15.			
8.	Common cattail (*Typha latifolia*)	H	OBL	16.			

Percent of dominant species that are OBL, FACW, or FAC: 100%

Remarks: Wetland vegetation present.

SOILS

Map unit name: FmhAt— loamy, 0 to 3 percent slopes,		Taxonomy (subgroup): Fluvaquents			
Soil drainage class: frequently flooded		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-12		10YR 2/2			Mucky sand

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material	X	High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Dark surface

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data	X	Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	3"	X	Hydric soil characteristics
Depth to saturated soil (inches):	0"		Other (describe in remarks)

Remarks: Saturated at surface.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes	X	No	
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 11, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes	X	No		Community ID:	
Is the site significantly disturbed?		Yes		No	X	Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-9
Remarks: B-9: Upland in forested area near pond at Northwest end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Roundleaf greenbriar (*Smilax rotundifolia*)	V	FAC	9.	Autumn olive (*Elaeagnus umbellata*)	S	FACU
2.	Black cherry (*Prunus serotina*)	T	FACU	10.			
3.	Red cedar (*Juniperus virginiana*)	T	FACU	11.			
4.	Japanese honeysuckle (*Lonicera japonica*)	V	FACU	12.			
5.	Allegheny blackberry (*Rubus allegheniensis*)	S	FACU	13.			
6.	Red oak (*Quercus rubra*)	T	FACU	14.			
7.	Callery pear (*Pyrus calleryana*)	T	NL	15.			
8.	Sumac (*Rhus typhina*.)	S	NL	16.			

Percent of dominant species that are OBL, FACW, or FAC: 11.1%.

Remarks:

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		10YR 4/4			Sandy loam
8-20		10YR 4/3			Sandy loam
20-24		2.5Y 4/2	5YR 5/8	15% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	24”		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-10
Remarks: B-10: Upland south side of runway west of the culvert.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Purple deadnettle (*Lamium purpureum*)	H	NL	9.			
2.	Canadian white violet (*Viola canadensis*)	H	FAC	10.			
3.	Wild onion (*Allium vineale*)	H	FACU	11.			
4.	Dandelion (*Taraxacum officinale*)	H	FACU	12.			
5.	Clover (*Trifolium repens*)	H	FACU	13.			
6.	Plantain (*Plantago lanceolata*)	H	FACU	14.			
7.	Chickweed (*Stellaria media*)	H	FACU	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%.							
Remarks: Maintained Lawn.							

SOILS

Map unit name: URSAAB- sandy, 0 to 8 percent slopes	Taxonomy (subgroup): Urban land		
Soil drainage class: Not rated	Field observations confirm mapped type?	Yes X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-2		10YR 3/2			Sandy loam
2-6		10YR 3/4	10YR 4/6	5% / Distinct	Sandy loam
6-12		10YR 3/4			Sandy loam
12-20		10YR 3/3	10YR 4/6	5% / Distinct	Sandy loam
20-24		2.5Y 5/2	10YR 4/6	30% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	24”		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-11
Remarks: B-11: Wetland South side of runway near culvert.							

VEGETATION

DOMINANT PLANT SPECIES							
		Stratum	Indicator			Stratum	Indicator
1.	Roundleaf greenbriar (*Smilax rotundifolia*)	V	FAC	9.	Skunk cabbage (*Symplocarpus foetidus*)	H	OBL
2.	Black willow (*Salix nigra*)	T	OBL	10.	Common reed (*Phragmites australis*)	H	FACW
3.	Dogbane (*Apocynum cannabinum*)	H	FAC	11.	Pennsylvania bittercress (*Cardamine pensylvanica*)	H	FACW
4.	Field pennycress (*Thlaspi arvense*)	H	UPL	12.			
5.	Soft rush (*Juncus effusus*)	H	OBL	13.			
6.	False nettle (*Boehmeria cylindrical*)	H	OBL	14.			
7.	Stilt grass (*Microstegium vimineum*)	H	FAC	15.			
8.	Japanese honeysuckle (*Lonicera japonica*)	V	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 81.8%							
Remarks:							

SOILS

Map unit name: URSAAB- sandy, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Not rated		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION					
Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		2.5YR 3/1	5YR 4/6	20% / Prominent	Sandy loam
8-16		2.5Y 4/2 & 10YR 4/6			Sandy loam
16-20		2.5Y4/2			Sandy loam
20-24		2.5Y 3/1	7.5YR 4/6	10% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS			
	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils	X	Other (obligates, topography, inundation, soil saturation, etc.)
Remarks: Gravely from 8-16". Saturated at surface.			

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data	X	Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS		X	Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	0"	X	Other (describe in remarks)
Remarks: Evidence of ponding.			

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes	X	No	
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-12
Remarks: B-12: Wetland west end of parallel taxiway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Canadian white violet (*Viola canadensis*)	H	FAC	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Tall Fescue (*Festuca arundinacea*)	H	FACU	14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 16.7%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 3/2			Sandy loam
4-8		10YR 3/1	5YR 3/4	5% / Prominent	Sandy loam
8-10		2.5Y 4/3			Loamy sand
10-14		10YR 3/1	5YR 3/4	5% / Prominent	Sandy loam
14-24		7.5YR 4/6 &10YR 3/1			Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Hydric soil criteria met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available	X	Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	24"		Other (describe in remarks)

Remarks: Water table at 24". Wetland hydrology present.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydrophytic vegetation is not present due to regular mowing; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes	X	No		Community ID:	
Is the site significantly disturbed?		Yes		No	X	Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-13
Remarks: B-13: Upland on forest edge south of the west end of the parallel taxiway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Pin oak (*Quercus palustris*)	T	FACW	9.			
2.	Viburnum (*Viburnum dentatum*)	T	FAC	10.			
3.	Clubmoss (*Lycopodium hickeyi*)	S	FACU	11.			
4.	Princess pine (*Lycopodium obscurum*)	S	FACU	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 50%

Remarks: Hydrophytic vegetation not present.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-5		10YR 3/3			Sandy loam
5-15		7.5YR 3/3	5YR 4/6	5% / Prominent	Sandy loam
15-20		2.5Y 4/3	5YR 4/6	5% / Prominent	Sandy loam
20-24		10YR 4/3	5YR 4/6	30% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	43"		Hydric soil characteristics
Depth to saturated soil (inches):	36"		Other (describe in remarks)

Remarks: No hydrology present within 24".

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-14
Remarks: B-14: Upland grassed area west side of Taxiway B.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Canadian white violet (*Viola canadensis*)	H	FAC	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Tall Fescue (*Festuca arundinacea*)	H	FACU	14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 16.7%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-3		10YR 3/3			Sandy loam
3-9		10YR 3/3	5YR 4/6	2% / Prominent	Sandy loam
9-18		2.5Y 4/3	7.5YR 5/8	20% / Prominent	Sandy loam
18-24		2.5Y 4/3	7.5YR 5/8	20% / Prominent	Sandy clayey loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	24"		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-15
Remarks: B-15: Wetland grassed area west side of Taxiway B.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Canadian white violet (*Viola canadensis*)	H	FAC	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Tall Fescue (*Festuca arundinacea*)	H	FACU	14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 16.7%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-2		10YR 3/3			Sandy loam
2-8		10YR 4/2	7.5YR 5/8	2% / Prominent	Sandy loam
8-16		2.5Y 4/1	7.5YR 4/6	10% / Prominent	Sandy loam
16-24		2.5Y 4/2	7.5YR 5/8	15% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Depleted matrix.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology presumed based on hydric soil characteristics.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydrophytic vegetation is not present due to regular mowing; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes	X	No		Community ID:	
Is the site significantly disturbed?		Yes		No	X	Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-16
Remarks: B-16: Wetland at forest edge near pond south of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Red maple (*Acer rubrum*)	T	FAC	9.			
2.	Sweet gum (*Liquidambar styraciflua*)	T	FAC	10.			
3.	Japanese honeysuckle (*Lonicera japonica*)	V	FACU	11.			
4.	Stilt grass (*Microstegium vimineum*)	H	FAC	12.			
5.	Soft rush (*Juncus effusus*)	H	OBL	13.			
6.	Skunk cabbage (*Symplocarpus foetidus*)	H	OBL	14.			
7.	Arrowwood (*Viburnum dentatum*)	S	FAC	15.			
8.				16.			
Percent of dominant species that are OBL, FACW, or FAC: 85.7%							
Remarks:							

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Holmdel		
Soil drainage class: Moderately well drained	Field observations confirm mapped type?	Yes X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 3/2			Sandy loam
4-15		2.5Y 3/1	5YR 4/6	10% / Prominent	Sandy loam
15-20		2.5Y 3/1	5YR 4/6	30% / Prominent	Sandy loam
20-24		2.5Y 4/3	5YR 4/6	20% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons	X	Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Hard masses of Iron in 15-20". Redox dark surface.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	24"		Other (describe in remarks)

Remarks: Presumed hydrology based on hydric soil presence.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes	X	No	
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 14, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-17
Remarks: B-17: Upland grassed area near pond south of the runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			
Percent of dominant species that are OBL, FACW, or FAC: 12.5%							
Remarks: Maintained lawn.							

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION					
Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-5		10YR 3/3			Sandy loam
5-10		10YR 3/3	7.5YR 5/8	5% / Prominent	Sandy loam
10-14		5Y 3/2 & 2.5Y 3/3	10YR 4/6	15% / Prominent	Sandy loam
14-19		2.5Y 3/1	5YR 3/4	30% / Prominent	Sandy loam
19-22		2.5Y 6/4	7.5YR 5/8 & 7.5 YR 4/6	30% / Prominent	Sandy loam
22-28		5GY 5/2			Sandy loam
28-31		2.5Y 6/6			Sandy loam
31-48		5Y 5/3			Sandy loam

HYDRIC SOIL INDICATORS			
	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)
Remarks: Field observations are not consistent with map unit description. Disturbed soil. Hydric soil not present within upper portion of the soil column. Hydric soil criterion not met.			

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	31"		Other (describe in remarks)
Remarks: Water table at 48". Hydrology criterion not met.			

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X
Remarks:				

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-18
Remarks: B-18: Upland area east of Taxiway B.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-14		2.5Y 4/4			Sandy loam
14-24		2.5Y 4/3	7.5YR 5/6	1% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-19
Remarks: B-19: Upland north of runway, opposite Taxiway C.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%.

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 4/3			Sandy loam
4-16		2.5Y 4/4			Sandy loam
16-24		2.5Y 4/4			Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-20
Remarks: B-20: Wetland south of eastern end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Tall Fescue (*Festuca arundinacea*)	H	FACU	9.			
2.	Plantain (*Plantago lanceolata*)	H	FACU	10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 0%

Remarks: Area lacking vegetative cover.

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes			Taxonomy (subgroup): Urban land		
Soil drainage class: Undefined			Field observations confirm mapped type?	Yes X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		5Y 3/2	7.5YR 4/6 & 6/8	15% & 5% / Prominent	Silty clay
8-16		GLEY1 4/10Y	7.5YR 4/6 & 6/8	15% & 5% / Prominent	Silty clay
16-24		GLEY1 4/10Y	2.5Y 6/6	15% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
X	Gleyed soils		Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Loamy Gleyed Matrix.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other	X	Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Evidence of wetland hydrology observed.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: This area is lacking a vegetative cover; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-21
Remarks: B-21: Wetland boring along southeast edge of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Tall Fescue (*Festuca arundinacea*)	H	FACU	9.			
2.	Plantain (*Plantago lanceolata*)	H	FACU	10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 0%

Remarks: Area lacking vegetative cover.

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Undefined		Field observations confirm mapped type?	Yes	X	No	

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-6		GLEY1 4/10Y	10YR 5/6	5% / Prominent	Silty clay
6-14		GLEY1 4/10Y	10YR 5/6 &7.5YR 4/6	10% & 20% / Prominent	Silty clay
14-20		2.5Y 4/3			Silty clay
20-24		GLEY1 4/10Y	5YR 5/8	30% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
X	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Gravely from 14-20". Loamy Gleyed Matrix.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other	X	Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Evidence of wetland hydrology observed.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: This area is lacking a vegetative cover; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-22
Remarks: B-22: Upland south near eastern edge of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Clover (*Trifolium repens*)	H	FACU	9.			
2.	Plantain (*Plantago lanceolata*)	H	FACU	10.			
3.	Tall Fescue (*Festuca arundinacea*)	H	FACU	11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 0%

Remarks: Maintained lawn.

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Undefined		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-11		2.5Y 4/3			Silty clay
11-16		10YR 3/2			Silty clay
16-20		2.5Y 4/3	7.5YR 4/6	5% / Prominent	Silty clay
20-24		2.5Y 3/2	10YR 5/8 & 7.5YR 4/6	5% & 3% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Hydric soil indicators are in horizons that are too small or too deep. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-23
Remarks: B-23: Upland at northeast corner of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Chickweed (*Stellaria media*)	H	FACU	9.			
2.	Clover (*Trifolium repens*)	H	FACU	10.			
3.	Plantain (*Plantago lanceolata*)	H	FACU	11.			
4.	Tall Fescue (*Festuca arundinacea*)	H	FACU	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 0%

Remarks: Maintained lawn.

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Undefined		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		10YR 3/3			Sandy clay loam
8-15		10YR 5/4			Sand
15- 24		GLEY1 4/10Y	7.5YR 4/6	40% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Gleyed soil not present in upper 12 inches of the soil column. Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-24
Remarks: B-24: Upland north of east end of runway.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Common blue violet (*Viola sororia*)	H	FAC	9.			
2.	Tall Fescue (*Festuca arundinacea*)	H	FACU	10.			
3.	Wild onion (*Allium vineale*)	H	FACU	11.			
4.	Chickweed (*Stellaria media*)	H	FACU	12.			
5.	Clover (*Trifolium repens*)	H	FACU	13.			
6.	Plantain (*Plantago lanceolata*)	H	FACU	14.			
7.				15.			
8.				16.			
Percent of dominant species that are OBL, FACW, or FAC: 16.7%.							
Remarks: Maintained lawn.							

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Undefined		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		10YR 3/3			Sandy clay loam
8-12		10YR 3/3	7.5YR 4/6	1% / Prominent	Sandy clay loam
12-19		2.5Y 3/3			Silty clay
19-24		2.5Y 3/3	7.5YR 4/6 & 5/8	40% swirled / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Gravely from 0-8 and 12-19". Hydric soils criterion not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)			FIELD INDICATORS
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-25
Remarks: B-25: Wetland northeast of eastern runway end.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Common Daylily (*Hemerocallis fulva*)	H	UPL	9.			
2.	Callery pear saplings (*Pyrus calleryana*)	T	NL	10.			
3.	Bittercress (*Cardamine pensylvanica*)	H	FACW	11.			
4.	Dogbane (*Apocynum cannabinum*)	H	FAC	12.			
5.	Japanese honeysuckle (*Lonicera japonica*)	V	FACU	13.			
6.	Soft rush (*Juncus effusus*)	H	OBL	14.			
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 50%

Remarks: Edge of vegetated swale. Wetland vegetation not present. Area is disturbed by mowing and agricultural activities.

SOILS

Map unit name: URCLAB- clayey substratum, 0 to 8 percent slopes		Taxonomy (subgroup): Urban land			
Soil drainage class: Undefined		Field observations confirm mapped type?	Yes	X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		10YR 3/3			Sandy clay loam
8-12		5Y 4/2	5YR 4/6	10% / Prominent	Sandy clay loam
12-16		5Y 3/2	5YR 4/6	10% / Prominent	Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Refusal at 16". Gravely from 8".

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Presumed hydrology based on hydric soil presence.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydric vegetation absent due to agricultural and mowing activities; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-26
Remarks: B-26: Wetland at edge of agricultural field at the eastern runway end.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Little bluestem (*Schizachyrium scoparium*)	H	FACU	9.			
2.	Switchgrass (*Panicum virgatum*)	H	FAC	10.			
3.	Mugwort (*Artemisia vulgaris*)	H	UPL	11.			
4.	White clover (*Trifolium repens*)	H	FACU	12.			
5.	Dandelion (*Taraxacum officinale*)	H	FACU	13.			
6.	Tall Fescue (Festuca arundinacea)	H	FACU	14.			
7.	Field peppergrass (*Lepidium campestre*)	H	FACU	15.			
8.				16.			

Percent of dominant species that are OBL, FACW, or FAC: 14.3%

Remarks: Edge of agricultural field.

SOILS

Map unit name: MapA- fine sandy loam, 0to 2 percent slopes		Taxonomy (subgroup): Marlton			
Soil drainage class: Well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-5		10YR 3/2			Sandy clay loam
5-24		GLEY1 4/10Y	7.5YR 4/6 & 4/8	15% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
X	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Loamy Gleyed Matrix hydric soil indicator present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Presumed hydrology based on hydric soil presence.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydric vegetation absent due to agricultural activities; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-27
Remarks: B-27: Upland west of East Apron.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: MapA- fine sandy loam, 0to 2 percent slopes		Taxonomy (subgroup): Marlton			
Soil drainage class: Well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-12		2.5Y 4/3			Sandy loam
12-17		2.5Y 4/3	7.5YR 5/8	2% / Prominent	Sandy clay loam
17-24		2.5Y 4/3	7.5YR 5/6	40% / Prominent	Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	20"		Other (describe in remarks)

Remarks: No water in pit. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	April 18, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-28
Remarks: B-28: Wetland south of eastern end of taxiway A.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: Urclab		Taxonomy (subgroup): Marlton			
Soil drainage class: Well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-5		2.5Y 3/3			Sandy loam
5-10		5Y 4/2	7.5YR 5/8	5% / Prominent	Silty clay
10-18		5Y 4/2	7.5YR 5/8	20% / Prominent	Silty clay

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils		Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Refusal at 18". Depleted matrix.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Presumed hydrology based on hydric soil presence.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydrophytic vegetation absent due to regular mowing; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-29
Remarks: B-29: Upland north of Runway near Wetland A.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Holmdel				
Soil drainage class: Moderately well drained	Field observations confirm mapped type?	Yes		No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-2		10YR 3/2			Sandy loam
2-4		10YR 4/2	7.5YR 4/6	10% / Prominent	Loamy sand
4-24		2.5Y 5/3			Loamy sand

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soil indicators are in horizons that are too small. Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No water in pit. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-30
Remarks: B-30: Upland north of Runway near Taxiway B.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Holmdel				
Soil drainage class: Moderately well drained	Field observations confirm mapped type?	Yes		No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 3/2			Loamy sand
4-20		10YR 4/3			Loamy sand
20-24		10YR 5/6			Loamy sand

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No water in pit. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-31
Remarks: B-31: Upland east of wind cone.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: HodA—fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Holmdel			
Soil drainage class: Moderately well drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-12		10YR 3/3			Loamy sand
12-20		10YR 4/4			Loamy sand
20-24		10YR 4/4			Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No water in pit. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-32
Remarks: B-32: Upland east of Taxiway C.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	N:	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: KreA- fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Kresson			
Soil drainage class: Somewhat poorly drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-3		10YR 3/3			Sandy loam
3-10		10YR 4/4			Sandy loam
10-20		10YR 5/4	10YR 3/3	5% / Faint	Sandy clay loam
20-24		10YR 5/4	10YR 5/8	5% / Prominent	Sandy clay loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: No water in pit. Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-33
Remarks: B-33: Upland east of Taxiway C near the Main Apron.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: KreA- fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Kresson				
Soil drainage class: Somewhat poorly drained	Field observations confirm mapped type?	Yes		No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 3/3			Sandy loam
4-24		10YR 4/4	10YR 5/8	2% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Hydric soils criterion not present.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-34
Remarks: B-34: Wetland north of the fuel storage area.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: KreA- fine sandy loam, 0 to 2 percent slopes	Taxonomy (subgroup): Kresson		
Soil drainage class: Somewhat poorly drained	Field observations confirm mapped type?	Yes X	No

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-8		2.5Y 3/2	5YR 5/6	20% / Prominent	Sandy loam
8-16		2.5Y 3/1	5YR 5/6	20% / Prominent	Sandy loam
16-24		2.5Y 4/1	5YR 5/6	20% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
X	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Asphalt and crushed stone present in soil from 0-16". Depleted matrix.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A	X	Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Presumed hydrology based on hydric soil presence.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes	X	No	
Wetland hydrology present?	Yes	X	No	
Is this sampling point within a wetland?	Yes	X	No	

Remarks: Hydrophytic vegetation is not present due to regular mowing; however, both hydric soils and wetland hydrology are present. This area is classified as a wetland.

WETLAND DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Project Site:	South Jersey Regional Airport					Date:	June 7, 2017
Applicant/Owner:	NJDOT					Project No:	60481340
Investigator(s):	Anthony Velazquez, Max Ojserkis, Rachel Nangle					County:	Burlington County, NJ
Do normal conditions exist on the site?		Yes		No	X	Community ID:	
Is the site significantly disturbed?		Yes	X	No		Transect ID:	
Is the area a potential Problem Area?		Yes		No	X	Plot ID:	B-35
Remarks: B-35: Upland northwest of fuel storage area.							

VEGETATION

DOMINANT PLANT SPECIES		Stratum	Indicator			Stratum	Indicator
1.	Wild onion (*Allium vineale*)	H	FACU	9.			
2.	Chickweed (*Stellaria media*)	H	FACU	10.			
3.	Clover (*Trifolium repens*)	H	FACU	11.			
4.	Plantain (*Plantago lanceolata*)	H	FACU	12.			
5.	Purple deadnettle (*Lamium purpureum*)	H	NL	13.			
6.	Indian strawberry (*Duchesnea indica*)	H	FACU	14.			
7.	Canadian white violet (*Viola canadensis*)	H	FAC	15.			
8.	Tall Fescue (*Festuca arundinacea*)	H	FACU	16.			

Percent of dominant species that are OBL, FACW, or FAC: 12.5%

Remarks: Maintained lawn.

SOILS

Map unit name: KreA- fine sandy loam, 0 to 2 percent slopes		Taxonomy (subgroup): Kresson			
Soil drainage class: Somewhat poorly drained		Field observations confirm mapped type?	Yes	No	X

SOIL PROFILE DESCRIPTION

Depth (in.)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Feature (RMF) Colors	Mottles (RMF) Abundance/Contrast	Soil Texture
0-4		10YR 3/2			Sandy loam
4-12		10YR 4/4			Sandy loam
12-20		10YR 4/4 & 10YR 2/2	5YR 5/6	10% / Prominent	Sandy loam
20-24		10YR 4/4 & 10YR 2/2	5YR 5/6	20% / Prominent	Sandy loam

HYDRIC SOIL INDICATORS

	Organic soils		Matrix chroma of 1 or less in un-mottled soils
	Histic epipedons		Iron and/or manganese concretions
	Sulfidic material		High organic matter content in surface horizon (sandy soils)
	Aquic or peraquic moisture regime		Organic streaking in subsurface horizons (sandy soils)
	Reducing conditions (colorimetric field tested)		Wet spodosols (sandy soils)
	Gleyed soils	X	Listed in National/State/County hydric soils list(s)
	Matrix chroma of 2 or less in mottled soils		Other (obligates, topography, inundation, soil saturation, etc.)

Remarks: Field observations are not consistent with map unit description. Soils are disturbed. Hydric soil indicators are in horizons that are too small or too deep; therefore, the hydric soils criterion is not met.

HYDROLOGY

RECORDED DATA (DESCRIBE IN REMARKS)		FIELD INDICATORS	
	Stream gauge data		Inundated
	Lake gauge data		Saturated in upper 12 inches
	Tidal gauge data		Water marks
	Flood prediction data		Drift lines
	Historical flood records		Water-borne sediment deposits
	Aerial photographs		Drainage patterns
	Other		Surface scouring/eroded sediments
	No recorded data available		Oxidized root channels
FIELD OBSERVATIONS			Water-stained leaves
Depth of surface water (inches):	N/A		Morphological plant adaptations
Depth to free-standing water in pit (inches):	N/A		Hydric soil characteristics
Depth to saturated soil (inches):	N/A		Other (describe in remarks)

Remarks: Hydrology criterion not met.

WETLAND DETERMINATION

Hydrophytic vegetation present?	Yes		No	X
Hydric soils present?	Yes		No	X
Wetland hydrology present?	Yes		No	X
Is this sampling point within a wetland?	Yes		No	X

Remarks:

Appendix B
Soils Information

United States Department of Agriculture

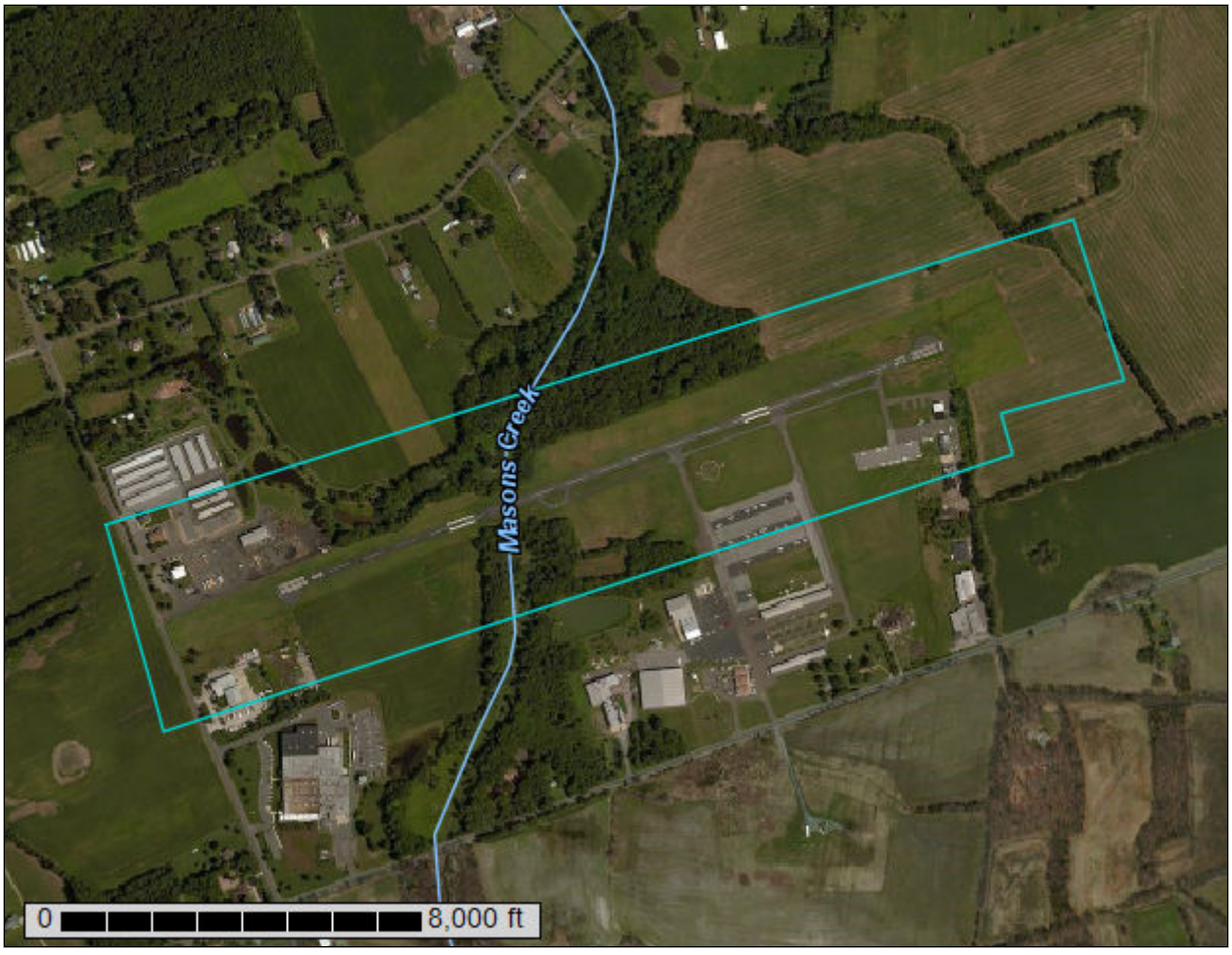
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Burlington County, New Jersey

South Jersey Regional Airport



April 4, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

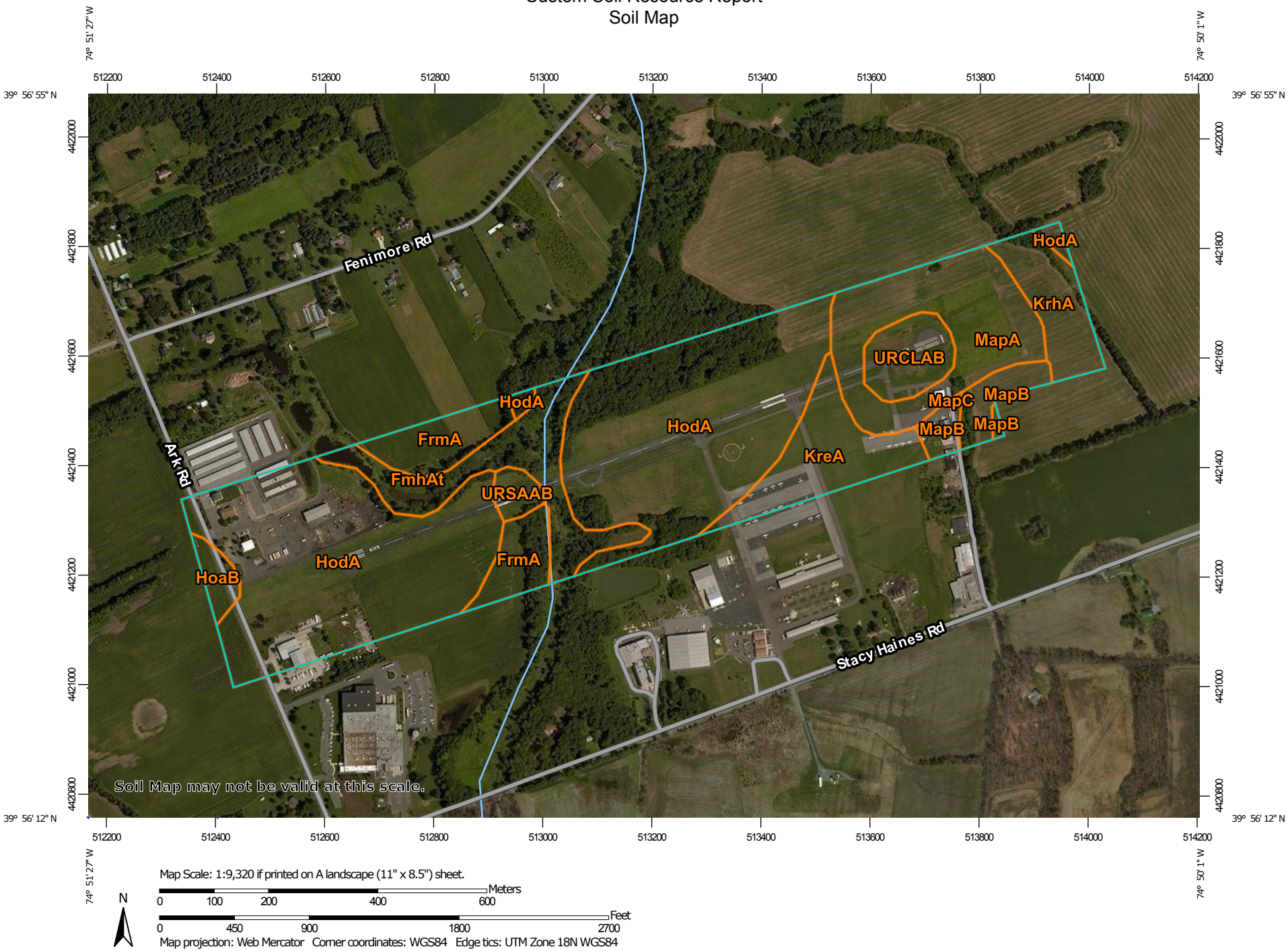
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Burlington County, New Jersey
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 25, 2011—Sep 17, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Burlington County, New Jersey (NJ005)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	12.0	8.4%
FrmA	Freehold fine sandy loam, 0 to 2 percent slopes	9.0	6.3%
HoaB	Holmdel loamy sand, 0 to 5 percent slopes	1.8	1.3%
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	74.8	52.4%
KreA	Kresson fine sandy loam, 0 to 2 percent slopes	9.9	6.9%
KrhA	Kresson loam, 0 to 2 percent slopes	6.6	4.6%
MapA	Marlton fine sandy loam, 0 to 2 percent slopes	17.2	12.0%
MapB	Marlton fine sandy loam, 2 to 5 percent slopes	1.8	1.3%
MapC	Marlton fine sandy loam, 5 to 10 percent slopes	2.9	2.0%
URCLAB	Urban land, clayey substratum, 0 to 8 percent slopes	5.1	3.6%
URSAAB	Urban land, sandy, 0 to 8 percent slopes	1.7	1.2%
Totals for Area of Interest		**142.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion

of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Burlington County, New Jersey

FmhAt—Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: v3t1
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents, loamy, frequently flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents, Loamy, Frequently Flooded

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent alluvium

Typical profile

A1 - 0 to 5 inches: loam
A2 - 5 to 12 inches: silt loam
C1 - 12 to 18 inches: sandy clay loam
C2 - 18 to 24 inches: sandy clay loam
C3 - 24 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Udifluvents, frequently flooded

Percent of map unit: 10 percent
Landform: Flood plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fluvaquents, loamy, frequently flooded
Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

FrmA—Freehold fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: rf1j
Elevation: 10 to 330 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Freehold and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freehold

Setting
Landform: Flats, low hills
Landform position (two-dimensional): Summit
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Glauconite bearing loamy eolian deposits and/or glauconite bearing loamy fluviomarine deposits

Typical profile
Ap - 0 to 11 inches: fine sandy loam
E - 11 to 15 inches: fine sandy loam
BA - 15 to 22 inches: fine sandy loam
Bt - 22 to 30 inches: sandy clay loam
BC - 30 to 35 inches: fine sandy loam
C - 35 to 60 inches: stratified loamy sand to fine sandy loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Keyport
Percent of map unit: 5 percent
Landform: Knolls
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Collington
Percent of map unit: 5 percent
Landform: Interfluves, flats
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

Sassafras
Percent of map unit: 5 percent
Landform: Knolls, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Holmdel
Percent of map unit: 5 percent
Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

HoaB—Holmdel loamy sand, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: rf28

Elevation: 10 to 170 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Holmdel and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holmdel

Setting

Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glauconite bearing loamy marine deposits and/or fluviomarine deposits

Typical profile

Ap - 0 to 18 inches: loamy sand
BA - 18 to 24 inches: sandy loam
Bt - 24 to 32 inches: sandy clay loam
C - 32 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Freehold

Percent of map unit: 5 percent
Landform: Low hills, knolls
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Shrewsbury

Percent of map unit: 5 percent
Landform: Depressions

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

HodA—Holmdel fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: rf2b
Elevation: 10 to 170 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Holmdel and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holmdel

Setting

Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glauconite bearing loamy marine deposits and/or fluviomarine deposits

Typical profile

Ap - 0 to 10 inches: fine sandy loam
AB - 10 to 14 inches: fine sandy loam
BA - 14 to 21 inches: sandy clay loam
Bt - 21 to 34 inches: sandy clay loam
C - 34 to 60 inches: stratified loamy sand to sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Atsion

Percent of map unit: 5 percent
Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Shrewsbury

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

KreA—Kresson fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: rf37
Elevation: 20 to 160 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance, if drained

Map Unit Composition

Kresson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kresson

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Glauconitic clayey marine deposits and/or glauconitic clayey fluviomarine deposits

Typical profile

A - 0 to 6 inches: fine sandy loam
Bt1 - 6 to 18 inches: clay
Bt2 - 18 to 33 inches: clay
Bt3 - 33 to 41 inches: clay
C - 41 to 80 inches: stratified sandy loam to sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Colemantown, occasionally flooded

Percent of map unit: 5 percent
Landform: Drainageways, depressions, flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Shrewsbury

Percent of map unit: 5 percent
Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Marlton

Percent of map unit: 5 percent
Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

KrhA—Kresson loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: rf38
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance, if drained

Map Unit Composition

Kresson and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kresson

Setting

Landform: Flats, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Glauconitic clayey marine deposits and/or glauconitic clayey fluviomarine deposits

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 20 inches: sandy clay
Bt2 - 20 to 36 inches: sandy clay loam
C - 36 to 60 inches: stratified sandy loam to sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Shrewsbury
Percent of map unit: 5 percent
Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Colemantown, occasionally flooded
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

MapA—Marlton fine sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: rf4h
Elevation: 20 to 160 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Marlton, well drained, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlton, Well Drained

Setting
Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glouconitic clayey marine deposits

Typical profile
Ap - 0 to 10 inches: fine sandy loam
Bt - 10 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 60 inches: sandy clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Adelphia, high glauconite

Percent of map unit: 5 percent
Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Kresson

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

MapB—Marlton fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: rf4j
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Marlton, well drained, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlton, Well Drained

Setting

Landform: Knolls, flats
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Glouconitic clayey marine deposits

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bt - 10 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 60 inches: sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Collington

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Adelphia, high glauconite

Percent of map unit: 5 percent
Landform: Low hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

MapC—Marlton fine sandy loam, 5 to 10 percent slopes

Map Unit Setting

National map unit symbol: rf4k
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Marlton, well drained, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlton, Well Drained

Setting

Landform: Knolls
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glouconitic clayey marine deposits

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bt - 10 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 60 inches: sandy clay loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Freehold

Percent of map unit: 5 percent
Landform: Flats, low hills
Landform position (two-dimensional): Summit
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

Collington

Percent of map unit: 5 percent
Landform: Knobs, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

URCLAB—Urban land, clayey substratum, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: v3v2
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, clayey substratum: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Clayey Substratum

Setting

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material; sandy marine deposits over clayey estuarine deposits

Typical profile

C1 - 0 to 6 inches: clay
C2 - 6 to 60 inches: stratified silt loam to clay

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

URSAAB—Urban land, sandy, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: v3v4
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, sandy substratum: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Sandy Substratum

Setting

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

C1 - 0 to 6 inches: sand
C2 - 6 to 60 inches: coarse sand, sand, gravelly sand
C2 - 6 to 60 inches:
C2 - 6 to 60 inches:

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

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LOCATION FREEHOLD NJ

Established Series
Rev. CFE-WCK
11/2015

FREEHOLD SERIES

The Freehold series are very deep, well drained, moderately permeable soils formed in marine sediments containing glauconite. These soils are on uplands in the coastal plains and have slopes ranging from 0 to 40 percent. Mean annual precipitation is 46 inches and mean annual temperature is 52 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, active, mesic Typic Hapludults

TYPICAL PEDON: Freehold sandy loam-cultivated (Colors are for moist soils.)

Ap--0 to 9 inches, Dark yellowish brown (10YR 4/4) sandy loam; very weak subangular blocky structure, parting to weak fine granular structure; friable; strongly acid; clear smooth boundary. (8 to 12 inches thick)

BA--9 to 12 inches, dark brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; some dark yellowish brown (10YR 4/4) materials from A horizon; strongly acid; clear wavy boundary. (0 to 8 inches thick)

Bt1--12 to 18 inches, dark brown (7.5YR 4/4) sandy loam; moderate medium subangular blocky structure parting to weak fine granular structure; friable, firm, in place, slightly plastic; clay films on faces of peds redder than centers of peds; few glauconite few faint grains; strongly acid; gradual wavy boundary. (4 to 10 inches thick)

Bt2--18 to 25 inches, dark brown (7.5YR 4/4) sandy clay loam, greener and redder variegations associated with pockets highter in glauconite grains; weak coarse subangular blocky structure parting to fine or medium subangular blocky structure; friable, firm in place, slightly plastic; common distinct clay bridging between sand grains; common glauconite grains; strongly adid; diffuse wavy boundary. (6 to 12 inches thick)

BC--25 to 35 inches, brown (7.5YR 5/4) sandy loam; massive; friable; common fine to medium sandsize grains of glauconite; very strongly acid; gradual wavy boundary. (3 to 14 inches thick)

C--35 to 70 inches, yellowish brown (10YR 5/8) loamy sand; single grain; loose; many dark glauconite grains; very strongly acid.

TYPE LOCATION: Monmouth County, New Jersey; 1/4 mile northwest of West Freehold along road to Wemrock, 200 feet west of road and 200 feet south of farm lane.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 30 to 45 inches. Rounded quartzose pebbles are typically absent but range to 5 percent. The A, B and upper part of the C horizons have 1 to 10 percent glauconite except some pedons have an uncomforming sandy loam or loamy sand mantle, up to 20 inches thick, which is deficient in glauconite. The soil ranges from strongly to extremely acid.

The Ap horizon has a hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 through 4. It ranges from loamy sand to loam. In uncultivated areas there is either a micro-podsol up to four inches thick, or an A1 horizon 1 to 6 inches thick and an A2 or A3 horizon 3 to 12 inches thick. The A1 horizon has hue of 10YR, value of 3 or 4 anc

chromas of 2 or 3. The A2 or A3 horizon is absent under many plowed layers but has hue of 7.5YR through 2.5Y, value of 4 or 5, chroma of 4 or 5. The A horizons have weak or moderate granular, subangular blocky or, in the lower part, platy structure.

The B horizon has hues of 7.5YR or 10YR, values of 4 through 6 and chromas of 4 through 8. It is sandy clay loam, loam or sandy loam and has a weighted average clay content of 18 to 25 percent. It has weak or moderate fine or medium subangular blocky structure.

The C horizon has hues of 5YR through 2.5Y. It is stratified loamy sand or sand with thin strata of sandy loam. Successive strata have ranges in glauconite content from traces to 20 percent; and differing degrees of iron cementation ranging from weakly cemented layers, up to 12 inches thick, to indurated sheets, up to 1 inche thick.

COMPETING SERIES: These are the Albermarle, Allegheny, Allenwood, Arendstville, Aura, Bedington, Birdsboro, Brevard, Bucks, Butano, Chester, Chilmark, Clymer, Collington, Colts Neck, Coolfont, Edgement, Edneyville, Elsinboro, Eubanks, Fairfax, Frankstown, Filpin, Glenelg, Leck Kill, Manassas, Meadowville, Murrill, Nixon, Quakertown, Rayne, Shelocta, Shouns, Tate, Thurmont, Ungers and Whiteford soils in the same family. All of the series in the same family except Collington and Colts Neck soils either lack glauconite or only contain isolated grains. Collington soils have more than 10 percent glauconite. Colts Neck soils have hues of 5YR or redder in the B horizon.

The Holmdel, Matapeake and Sassafras series are similar soils in related families. Holmdel soils are mottled within 24 inches of the top of the argillic horizon. Matapeake and Sassafras soils either lack glauconite or only have isolated grains.

GEOGRAPHIC SETTING: Freehold soils are gently to steeply sloping soils on uplands. They formed in sandy marine coastal plain sediments which have small to moderate amounts of glauconite except a mantle up to 20 inches thick may lack glauconite. The mean annual temperature ranges from 45 to 55 degrees F., and the mean annual precipitation ranges from 40 to 48 inches, distributed fairly uniformly throughout the year.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Collington, Colts Neck, Holmdel, and Sassafras soils and the Adelphia, Pemberton and Tinton soils. Adelphia soils are moderatey well to somewhat poorly drained. Pemberton and Tinton soils have sand or loamy sand surface horizons more than 20 inches thick.

DRAINAGE AND PERMEABILITY: Freehold soils are well drained. Runoff is slow to rapid, depending on slope. Permeability is moderate.

USE AND VEGETATION: Except for steep areas, these soils are generally cleared and used for growing vegetables, fruits and specialty crops. Woodland species include black, white, scarlet and northern red oaks, yellow-poplar, hickory and beech.

DISTRIBUTION AND EXTENT: The inner coastal plain of New Jersey and probably Maryland. Moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: RALEIGH, NORTH CAROLINA

SERIES ESTABLISHED: Burlington and Camden Counties, New Jersey. 1936.

National Cooperative Soil Survey
U.S.A.

LOCATION HOLMDEL NJ+MD

Established Series
SK/Rev. DHK
11/2015

HOLMDEL SERIES

Note: This series is open for peer review. Please send comments by May 20, 2003 to: skeenan@nj.nrcs.usda.gov and forward all comments to MO-13 Data Quality Specialist (david.kingsbury@wv.usda.gov)

Changes have been made to the Landscape/Landform, Parent Material, Range in characteristics, and Pedon Description.

MLRA(s): 149A, 153C
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: RALEIGH, NORTH CAROLINA
Depth Class: Very deep
Drainage Class (Agricultural): Moderately well drained and somewhat poorly drained
Internal Free Water Occurrence: Moderately deep and shallow
Index Surface Runoff: Negligible to medium
Permeability: Moderate
Landscape: Coastal Plain
Landform: Flat, depression, drainageway, swale
Parent Material: Loamy glauconite bearing marine and/or fluviomarine sediments
Major Uses: Generally cleared and used for growing vegetables, fruits and specialty crops.
Dominate Vegetation: Mixed upland oaks, sweetgum, yellow poplar, hickory, red maple, sassafras, and American beech
Slope: 0 to 5 percent
Elevation (type location): 150 feet
Mean Annual Air Temperature (type location): 56 degrees F.
Mean Annual Precipitation (type location): 44 inches

TAXONOMIC CLASS: Fine-loamy, mixed, active, mesic Aquic Hapludults

TYPICAL PEDON: Holmdel sandy loam, 2 to 5 percent slopes, cultivated. (Colors are for moist soil.)

Ap--0 to 12 inches; dark grayish brown (10YR 4/2) sandy loam; moderate, coarse granular structure parting to moderate, medium granular structure; friable; many roots; 2 percent glauconite pellets by volume; very strongly acid; abrupt smooth boundary. (6 to 12 inches thick)

Bt1--12 to 20 inches; yellowish brown (10YR 5/4) sandy loam; weak, coarse subangular blocky structure parting to weak, medium subangular blocky structure; friable; many roots; 2 percent glauconite pellets by volume; few thin patchy clay films on ped faces; very strongly acid; gradual wavy boundary.

Bt2--20 to 38 inches; yellowish brown (10YR 5/6) sandy clay loam, moderate, coarse subangular blocky structure parting to moderate, medium subangular blocky structure; firm, slightly sticky, slightly plastic; common roots; few fine prominent light olive gray (5Y 6/2) iron depletions; and common fine and medium distinct light olive brown (2.5Y 5/4) iron masses; 5 percent glauconite pellets by volume; common thin discontinuous clay films on ped faces; very strongly acid; gradual wavy boundary. (Combined thickness of the Bt horizon is 10 to 48 inches)

BC--38 to 42 inches; yellowish brown (10YR 5/6) sandy loam; massive; very friable; few fine roots; few fine prominent light olive gray (5Y 6/2) iron depletions, and few medium prominent yellowish red (5YR 5/8) iron masses; 5 percent glauconite pellets by volume; extremely acid; abrupt smooth boundary.

C--42 to 80 inches; light olive brown (2.5Y 5/4) sand; single grain; loose; common medium distinct light olive gray (5Y 6/2) iron depletions; 10 percent glauconite pellets by volume; few, thin, discontinuous, weak, iron-cemented ironstone interlayers; extremely acid.

TYPE LOCATION: Monmouth County, New Jersey; Millstone Township. Fifty feet north of Nurko Road, one tenth miles west of Rockdale Road; USGS Roosevelt Quadrangle, latitude 40 degrees, 13 minutes, 46 seconds N., and longitude 74 degrees, 28 minutes, 31 seconds W.

RANGE IN CHARACTERISTICS:
Depth to the top of the Argillic Horizon: 6 to 18 inches
Depth to the bottom of the Argillic Horizon: 20 to 50 inches, or more
Depth to Bedrock: Greater than 72 inches
Depth to Seasonal High Water Table: 12 to 42 inches, December to May
Rock Fragments: Typically 0 to 5 percent, by volume, in the A, B, and C horizons mostly fine or medium size, rounded, quartzose gravel. Thin strata may contain up to 30 percent gravel
Soil Reaction: Extremely acid or very strongly acid throughout the profile, unless limed
Content of glauconite: Low, 0 to 10 percent pellets (by volume) in the A horizon, 2 to 10 percent pellets in the B horizon, and 2 to 15 percent pellets in the C horizon. Glauconite content in the C horizon is more commonly 2 to 10 percent.

RANGE OF INDIVIDUAL HORIZONS:
A or Ap horizon:
Color--hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6
Texture--loam, fine sandy loam, sandy loam, or loamy sand.

E horizon (if it occurs):
Color--hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 to 3
Texture--loam, fine sandy loam, sandy loam, or loamy sand.

BA or BE horizon (if it occurs):
Color--hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6
Texture- loam, fine sandy loam, sandy loam, or loamy sand.

Bt horizon:
Color--hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 3 to 6.
Texture-sandy clay loam, clay loam, loam, or sandy loam.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and
Iron masses in shades of red, brown, yellow, or olive.

Btg horizon (if it occurs):
Color--hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2.
Texture-sandy clay loam, clay loam, loam, or sandy loam.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and

iron masses in shades of red, brown, yellow, or olive.

BC horizon:
Color--hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 3 to 6.
Texture- loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand. In some pedons thin interlayers,

isolated pockets, or thin lenses of weak iron-cemented sandy materials may occur.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and iron masses in shades of red, brown, yellow, or olive.

BCg horizon (if it occurs):
Color--hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2, or interlayered with hue of 5GY to 5G, value of 3 to 5, and chroma of 1 or 2.
Texture- loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand. In some pedons thin interlayers, isolated pockets, or thin lenses of weak iron-cemented sandy materials may occur.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and iron masses in shades of red, brown, yellow, or olive.

C horizon:
Color--hue of 7.5YR to 5Y, value of 4 to 7, and chroma of 3 to 8.
Texture-loamy sand, loamy fine sand, fine sand or sand, or is stratified with textures ranging from sandy loam to sand. In some pedons thin interlayers, or isolated pockets of clayey textures, or thin lenses of weak iron-cemented sheets may.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and iron masses in shades of red, brown, yellow, or olive

Cg horizon (if it occurs):
Color--hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or interlayered with hue of 5GY to 5G, value of 3 to 5, and chroma of 1 or 2.
Texture-loam, sandy loam, fine sandy loam, very fine sandy loam, loamy very fine sand, loamy sand, sand, or coarse sand, or may be stratified with these textures. In some pedons thin interlayers, isolated pockets, or thin lenses of weak iron-cemented sandy materials may occur.
Redoximorphic Features--iron depletions in shades of olive, gray, or white and iron masses in shades of red, brown, yellow, or olive

COMPETING SERIES:
Adelphia soils-- have l0 to 20 percent glauconite pellets in the mineralogy control section.
Bigpool soils--formed in alluvium derived from sedimentary rocks
Blairton soils--formed in residuum from gray shale and are moderately deep to hard bedrock
Cotaco soils--formed in alluvium, and colluvium derived from sandstone, siltstone, and shale
Delanco soils--formed in materials weathered from micaceous crystalline rocks
Dillard soils--formed in loamy alluvium in the Blue Ridge Mountains
Fenwick soils--formed in residuum from sandstone, siltstone, and shale and are moderately deep to hard bedrock
Trackler soils--formed in colluvium and residuum from fine-grained igneous rocks
Tuscarawas soils--formed in colluvium and residuum derived from clay shale
Wharton soils--formed in residuum from sandstone, siltstone, and shale
Whiteside soils--formed in colluvium in the Southern Appalachian Mountains
Woodstown soils--formed in marine sediments that do not contain glauconite pellets

GEOGRAPHIC SETTING:
Landscape: Coastal Plain
Landform: Flat, depression, drainageway, swale
Parent Material: Loamy glauconite bearing marine and/or fluviomarine sediments Slope: 0 to 5 percent
Elevation: 5 to 170 feet
Mean Annual Air Temperature: 50 to 58 degrees F.
Mean Annual Precipitation: 42 to 48 inches

Frost Free Period: 180 to 215 days

GEOGRAPHICALLY ASSOCIATED SOILS:
Adelphia soils-are moderately well drained, have seasonal high water tables at 18 to 42 inches, with l0 to 20 percent glauconite pellets in the mineralogy control section, formed in similar parent materials; on slightly lower-lying landforms
Colts Neck soils- are well drained, have seasonal high water tables >72 inches, with similar glauconite pellet contents in the subsoil, formed in similar parent materials; on slightly higher landforms
Freehold soils-are well drained, have seasonal high water tables >72 inches, with similar glauconite pellet contents in the subsoil, formed in similar parent materials; on slightly higher landforms
Marlton soils-are moderately well drained, have seasonal high water tables at 18 to 42 inches, greater than 35 percent clay in the Bt horizons, 20 percent or more glauconite pellets in the mineralogy control section; formed in marine deposits higher in glauconite pellets , on similar landforms
Kresson soils- are somewhat poorly drained, have seasonal high water tables at 12 to 18 inches, greater than 35 percent clay in the Bt horizons, 20 percent or more glauconite pellets in the mineralogy control section; formed in marine deposits higher in glauconite pellets , on lower-lying landforms
Collington soils- are well drained with seasonal high water tables >72 inches, have l0 to 20 percent glauconite pellets in the minerology control section, formed in similar parent materials; on higher landforms
Colemantown- are poorly drained, have seasonal high water tables at 0 to 12 inches, greater than 35 percent clay in the Bt horizons, 20 percent or more glauconite pellets in the mineralogy control section; formed in marine deposits higher in glauconite pellets, on lower-lying landforms

DRAINAGE AND PERMEABILITY:
Drainage class (Agricultural): Moderately well (18 to 42 inches) and somewhat poorly (12 to 18 inches) below the surface mostly during the months of December to April
Internal Free Water Occurrence: Moderately deep (20 to 40 inches) and shallow (10 to 20 inches) and common (present 3 to 6 months)
Index Surface Runoff: Negligible to very high
Permeability: Moderate

USE AND VEGETATION:
Major Uses: Historically cleared and used for corn, wheat, soybeans, hay, pasture, fruits, vegetables, and nursery.
Dominate Vegetation: Mixed upland oaks, sweetgum, yellow-poplar, hickory, red maple, sassafras, and American beech

DISTRIBUTION AND EXTENT:
Distribution: Coastal Plain of New Jersey and Maryland
Extent: Moderate

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Burlington County, New Jersey, 1967

REMARKS: 5/2003--This revision updates redoximorphic features to current standards and revises competing series and geographically associated soils sections. The content of glauconite in the C horizon was also broadened from 2 to 10 percent to 2 to 15 percent to facilitate the correlation of Anne Arundel County, Maryland. Additionally, colors, geographic setting, parent materials and other features as well as ranges in characteristics were also revised. This OSD was also converted to tabular format. This series has historically been used as a dual drainage class soil and has been maintained with this revision to facilitate ongoing correlations.

Some pedons have been observed to have thin, weakly iron-cemented lenses in the C horizon of this soil. These lenses have not been described to be significant enough for a petroferric contact or zone of induration.

Diagnostic horizons and soil characteristics recognized in this pedon are:
Ochric epipedon--the zone from 0 to 12 inches (Ap horizon)
Argillic horizon--the zone from 12 to 38 inches (Bt1 and Bt2 horizons)
Aquic conditions (Aquic subgroup)--iron depletions and concentrations at 20 inches (within upper 24 inches of the argillic horizon)

Low glauconite pellet content feature---glauconite pellet content averages between 2 and 10 percent by volume within the mineralogy control section (upper 20 inches of the argillic horizon)

ADDITIONAL DATA:

OSD Data Map Unit ID: 000000 (to be developed)
OSD User Pedon ID: 00XX000000 (to be developed)

TABULAR SERIES DATA:

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SOI-5 Soil Name Slope Airtemp FrFr/Seas Precip Elevation
NJ0022 HOLMDEL  0- 5  50- 58  180-215   42- 48  5-170
SOI-5  FloodL FloodH Watertable Kind   Months  Bedrock Hardness
NJ0022 NONE          1.0-3.5  APPARENT DEC-APR    >72
SOI-5  Depth  Texture               3-Inch  No-10  Clay%   -CEC-
NJ0022  0-12  L FSL                   0-  0  95-100 10-15   6- 12
NJ0022  0-12  LS LFS SL               0-  0  95-100  5-10   5- 10
NJ0022 12-38  SL SCL L                0-  0  95-100 15-30   6- 12
NJ0022 38-60  SR SL S                 0-  0  90-100  2-15   2-  6
SOI-5  Depth    -pH-     O.M.  Salin  Permeab   Shnk-Swll
NJ0022  0-12  3.6- 5.5  1.-3.  0- 0   0.6- 6.0  LOW
NJ0022  0-12  3.6- 5.5  1.-2.  0- 0   2.0-  20  LOW
NJ0022 12-38  4.5- 5.5  .5-1.  0- 0   0.6- 2.0  LOW
NJ0022 38-60  4.5- 5.5  0.-.5  0- 0   2.0-  20  LOW

Revised: 08/2002-SK, JAK; 05/2003-SK, DHK
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National Cooperative Soil Survey
U.S.A.

LOCATION KRESSON NJ

Established Series
SCK/Rev. JAK
11/2015

KRESSON SERIES

Note: This series is open for peer review. Please send comments by July 15, 2002 to: skeenan@nj.nrcs.usda.gov

Changes have been made to the Landscape/Landform, Parent Material, and Range in characteristics, and series location and description.

TAXONOMIC CLASS: Fine, glauconitic, mesic Aquic Hapludults
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: RALEIGH, NORTH CAROLINA
Depth Class: Very deep
Drainage Class (Agricultural): Somewhat poorly drained
Internal Free Water Occurrence: Shallow and common
Flooding Frequency and Duration: None
Ponding Frequency and Duration: none
Index Surface Runoff: Medium or high
Permeability: Slow
Shrink-Swell Potential: Moderate
Landscape: Northern Atlantic Coastal Plain
Landform: Depression, flat, drainageway, low hill
Geomorphic Component: Base slope, dip
Hillslope Profile Position: Toeslope
Parent Material: Clayey glauconite marine and/or fluviomarine deposits
Slope: 0 to 5 percent
Elevation (type location): 75 feet
Frost free period (type location): 195 days
Mean Annual Air Temperature (type location): 56 degrees F.
Mean Annual Precipitation (type location): 45 inches

TAXONOMIC CLASS: Fine, glauconitic, mesic Aquic Hapludults

TYPICAL PEDON: Kresson fine sandy loam (in an area of Kresson fine sandy loam, 0 to 2 percent slopes), in hardwoods. (Colors are for moist soil.)

A--0 to 6 inches; very dark grayish brown (2.5Y 3/2), fine sandy loam, grayish brown (10YR 5/2), dry; moderate medium granular structure; friable, slightly sticky, slightly plastic; common fine roots; 5 percent glauconite pellets; 10 percent rounded quartzite gravel; strongly acid; clear smooth boundary. (6 to 12 inches thick)

Bt1--6 to 18 inches; olive (5Y 4/3) clay; moderate coarse prismatic parting to moderate medium angular blocky structure; firm, slightly sticky, slightly plastic; few fine roots; common fine irregular pores; common continuous prominent clay films on faces of peds; common medium and coarse prominent strong brown (7.5YR 5/8) masses of oxidized iron; 35 percent glauconite pellets; 10 percent rounded quartzite gravel; very strongly acid; gradual smooth boundary.

Bt2--18 to 33 inches; dark greenish gray (5G 3/1) clay; strong coarse prismatic parting to strong medium angular blocky structure; firm, sticky, plastic; few fine roots; common fine irregular pores; many continuous prominent clay films on faces of peds; many medium and coarse prominent strong brown (7.5YR 5/6) and brown (7.5YR 4/4) masses of oxidized iron; 45 percent glauconite pellets; very strongly acid; gradual smooth boundary.

Bt3--33 to 41 inches; dark grayish green (5G 3/2) clay; moderate coarse prismatic parting to moderate medium angular blocky structure; very firm; sticky, plastic; few fine irregular pores; many continuous, prominent clay films on ped faces; common medium prominent brown (7.5YR 4/4) iron concentrations; 45 percent glauconite pellets; 2 percent quartzite gravel; very strongly acid; clear smooth boundary. (Combined thickness of the Bt horizon is 15 to 40 inches.)

C--41 to 80 inches; olive (5Y 4/3) and light yellowish brown (2.5Y 6/4) stratified sandy loam and sandy clay loam; massive; friable, nonsticky, nonplastic; 25 percent glauconite; very strongly acid.

TYPE LOCATION: Gloucester County, New Jersey, 0.2 mile north of intersection of State Highway 41 and State Highway 47 at Fairview, on State Highway 41, 350 feet east of State Highway 41, on a flat in mature hardwoods, USGS Runnemede, NJ topographic quadrangle; latitude 39 degrees 47 minutes 47 seconds N. and long. 75 degrees 05 minutes 51 seconds W.

RANGE IN CHARACTERISTICS:
Depth to top of Argillic horizon: 6 to 15 inches
Depth to base of Argillic horizon: 30 to 55 inches
Depth to Bedrock: Greater than 72 inches
Depth to Seasonal High Water Table: 12 to 18 inches, November to May
Rock Fragments: 0 to 15 percent, by volume throughout; mostly quartzite pebbles or ironstone fragments. Thin strata contain may contain 20 to 35 percent fragments in the subsoil.
Soil Reaction: Extremely acid to strongly acid throughout, unless limed. Stratified black or greenish black layers within the C horizon, may be ultra acid upon exposure to air.
Content of Glauconite: Weighted average of 0 to 20 percent pellets, by volume in A horizon and more than 20 percent in the B and C horizons.

RANGE OF INDIVIDUAL HORIZONS:
Ap or A horizons:
Color--hue of 5Y to 10YR, value of 3 or 4, chroma of 2 to 4
Texture--sandy loam, fine sandy loam, or loam

BA or BE horizons (if it occurs):
Color--hue of 5Y to 10YR, value of 4 to 6, chroma of 2 to 4
Texture--sandy loam, fine sandy loam, or loam

Bt horizons:
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 5GY to 5G, value of 2.5 to 6, chroma of 1 or 2
Texture (fine earth fraction)--clay, sandy clay, clay loam or thin subhorizons of sandy clay loam
Redoximorphic features-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions of chroma 2 or less may occur within the upper Bt horizon below 12 inches, but in most pedons they are difficult to distinguish due to the masking effects of the dark olive and dark greenish parent materials.

BC horizon (if it occurs):
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 5GY to 5G, value of 2.5 to 6, chroma of 1 or 2
Texture (fine earth fraction)--sandy clay, sandy clay loam, loam, or sandy loam
Redoximorphic features-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions with chroma of 2 or less may be present within

this layer, but in most pedons they are difficult to distinguish due to the masking effects of the dark olive and dark greenish parent materials.

C horizon:
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 10Y to 5G, value of 2.5 to 6, and chroma of 1 or 2
Texture (fine earth fraction)--sandy loam, sandy clay loam, sandy clay, or clay, and is commonly stratified with sandy texture
Redoximorphic features (if they occur)-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions with chroma of 2 or less may be present within this layer, but in most pedons they are difficult to distinguish due to the masking effects of the dark olive and dark greenish parent materials.

COMPETING SERIES:
Marlton soils-have a seasonal high water table at a depth of 18 to 42 inches (moderately well drained) with similar glauconite content; on slightly higher landforms

GEOGRAPHIC SETTING:
Landscape: Northern Atlantic Coastal Plain
Landform: Depression, flat, drainageway, low hill
Geomorphic Component: Base slope, dip
Hillslope Profile Position: Toeslope
Parent Material: Clayey glauconite fluviomarine deposits
Slope: 0 to 5 percent
Elevation: 25 to 160 feet
Frost Free Period: 180 to 210 days
Mean Annual Air Temperature: 50 to 56 degrees F.
Mean Annual Precipitation: 40 to 48 inches

GEOGRAPHICALLY ASSOCIATED SOILS:
Adelphia soils--are in a fine-loamy family, contain less than 20 percent glauconite pellets in the control section; on similar landforms
Colemantown soils--are poorly drained, with similar glauconite contents; on lower-lying landforms
Collington soils--are well drained, in a fine-loamy family particle-size control section, contain less than 20 percent glauconite pellets in the control section; on higher landforms
Colts Neck soils--are well drained, in a fine-loamy family, contain less than 20 percent glauconite pellets in the control section; on higher landforms
Freehold soils--are well drained, in a fine-loamy family,
contain less than 10 percent glauconite pellets in the control section; on higher landforms
Marlton soils--are moderately well drained, with similar glauconite contents; on slightly higher landforms

DRAINAGE AND PERMEABILITY:
Depth Class: Very deep (greater tan 72 inches) to bedrock
Drainage Class (Agricultural): Somewhat poorly drained
Internal Free Water Occurrence: Shallow (10 to 20 inches) and common (3 to 6 months)
Flooding Frequency and Duration: None
Ponding Frequency and Duration: none
Index Surface Runoff: Medium or high
Permeability: Slow
Shrink-Swell Potential: Moderate

USE AND VEGETATION:
Major Uses: Historically cleared and used for corn, tomatoes, soybeans, hay and pasture. However, in New Jersey most areas have rapidly become urbanized. Dominant Vegetation: Wooded areas are dominantly sweetgum, red maple, white oak, and yellow poplar.

DISTRIBUTION AND EXTENT:
Distribution: New Jersey
Extent: Small

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Monmouth County, New Jersey 1946

REMARKS: It is believed that Kresson soils have aquic conditions and have episaturation. The classification of these soils as Aquic Hapludults is based on evidence of wetness other than low chroma. Low chroma depletions which are normal in other somewhat poorly drained soils are rare in these soils. For this reason the depth to, extent, and distinctness of high chroma masses of oxidized iron have been used to group these soils with soils of similar natural drainage.
12/2001--This revision relocates the official Kresson type location to a different map unit in Gloucester County because the previous location has become urbanized.

Diagnostic horizons and other soil characteristics recognized in this pedon are:
Ochric epipedon--the zone from the soil surface to a depth of 6 inches (A horizon).
Argillic horizon--the zone from 8 to 41 inches (Bt1, Bt2, Bt3 horizons)
Aquic conditions--the soil has periodic saturation and reduction within 12 to 18 inches of the soil surface, and one or more unsaturated layers within 80 inches of the surface, occurring below the periodically saturated zone(episaturation).

Other soil features identified with this pedon:
Series control section--the zone from 0 to 60 inches

ADDITIONAL DATA: The following pedons are available from the NRCS-Survey Laboratory, Lincoln, NE: S77NJ-005-002

Database Information:
OSD Data Mapunit ID: To be developed
Typical Pedon Data Mapunit ID: 407466
OSD User Pedon ID: To be developed

TABULAR SERIES DATA:

SOI-5	Soil Name	Slope	Airtemp	FrFr/Seas	Precip	Elevation
NJ0056	KRESSON	0-5	50-56	180-210	40-48	25-160

SOI-5	FloodL	FloodH	Watertable	Kind	Months	Bedrock	Hardness
NJ0056	NONE		1.0-1.5	PERCHED	DEC-MAY	>72	--

SOI-5	Depth	Texture	3-Inch	No-10	Clay%	-CEC-
NJ0056	0-14	FSL SL L	0- 0	85-100	10-20	-
NJ0056	0-14	LS	0- 0	85-100	5-15	-
NJ0056	14-30	C CL SC	0- 0	90-100	35-45	-
NJ0056	30-60	SR SL C	0- 0	90-100	30-45	-

SOI-5	Depth	-pH-	O.M.	Salin	Permeab	Shnk-Swll
NJ0056	0-14	3.6- 5.5	2.-4.	0- 0	0.2- 6.0	MODERATE
NJ0056	0-14	3.6- 5.5	.5-3.	0- 0	2.0- 6.0	LOW
NJ0056	14-30	3.6- 5.5	-	0- 0	0.06- 0.2	MODERATE
NJ0056	30-60	3.6- 5.5	-	0- 0	0.06- 0.2	LOW

National Cooperative Soil Survey
U.S.A.

LOCATION MARLTON NJ+MD

Established Series
SCK/Rev. JAK
11/2002

MARLTON SERIES

Note: This series is open for peer review. Please send comments by July 15, 2002 to: skeenan@nj.nrcs.usda.gov

Changes have been made to the Landscape/Landform, Parent Material, and Range in characteristics.

MLRA(S): 149A, 153C
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia
Depth Class: Very deep
Drainage Class (Agricultural): Moderately well drained
Internal Free Water Occurrence: Moderately deep and common
Flooding Frequency and Duration: None
Ponding Frequency and Duration: None
Index Surface Runoff: Medium to very high
Permeability: Slow
Shrink-Swell Potential: Moderate
Landscape: Northern Atlantic Coastal Plain
Landform: Low hill, flat, depression
Geomorphic Component: Base slope, rise
Hillslope Profile Position: Summit, backslope, footslope
Parent Material: Clayey glauconite marine and/or fluviomarine deposits
Slope: 0 to 40 percent
Elevation (Type location): 80 feet
Frost Free Period (type location): 195 days
Mean Annual Air Temperature (type location): 56 degrees F.
Mean Annual Precipitation (type location): 45 inches

TAXONOMIC CLASS: Fine, glauconitic, mesic Aquic Hapludults

TYPICAL PEDON: Marlton sandy loam, 2 to 5 percent slopes, cultivated. (Colors are for moist soil.)

Ap--0 to 10 inches, olive-gray (5Y 4/2) sandy loam, grayish brown (2.5Y 5/2), dry; moderate medium granular structure; friable, slightly sticky, slightly plastic, many fine roots and many very fine roots; common fine interstitial pores; 10 percent glauconite pellets; 5 percent rounded quartzite gravel; strongly acid; abrupt smooth boundary. (5 to 12 inches thick)

Bt1--10 to 20 inches, olive (5Y 4/3) clay; moderate coarse prismatic parting to moderate medium subangular blocky structure; very firm, sticky, plastic; common fine roots and common very fine roots mainly along structural faces; few fine irregular pores; many continuous prominent clay films on faces of peds; few continuous prominent pressure faces on vertical faces of peds; few medium distinct brown (7.5YR 4/4) masses of oxidized iron in the lower part of the horizon; 35 percent glauconite pellets; 1 percent rounded quartzite gravel; very strongly acid; gradual smooth boundary.

Bt2--20 to 28 inches, olive (5Y 4/4) clay; moderate coarse prismatic parting to moderate medium subangular blocky structure; very firm, sticky, plastic; few very fine roots mainly along structural faces; few fine irregular pores; many continuous prominent clay films on all ped faces; few continuous prominent pressure faces on

vertical ped faces; common medium prominent strong brown (7.5YR 5/6) and few medium prominent dark reddish brown (5YR 3/4) masses of oxidized iron; 45 percent glauconite pellets; 1 percent rounded quartzite gravel; very strongly acid; gradual smooth boundary.

Bt3--28 to 47 inches, dark grayish green (5G 3/2) clay; moderate coarse prismatic parting to moderate medium subangular blocky structure; very firm, sticky, plastic; few fine irregular pores; many continuous prominent clay films on faces of peds; few continuous prominent pressure faces on vertical faces of peds; common medium prominent dark reddish brown (5YR 3/4) masses of oxidized iron; 50 percent glauconite pellets; 1 percent rounded quartzite gravel; very strongly acid; clear smooth boundary. (Combined thickness of the Bt horizon is 15 to 50 inches.)

C--47 to 80 inches, dark greenish gray (5G 3/1), greenish black (10Y 2.5/1), and yellowish brown (10YR 5/6) stratified sandy loam and sandy clay loam; massive; friable or very friable; slightly sticky, slightly plastic; 60 percent glauconite pellets; very strongly acid.

TYPE LOCATION: Gloucester County, New Jersey; about 1.4 miles northwest from intersection of County Road 538 and State Highway 45 on State Highway 538, 100 feet northeast of State Highway 538 on a footslope, in cropland; USGS Woodstown, NJ topographic quadrangle, lat. 39 degrees 43 minutes 38 seconds N; long. 75 degrees 16 minutes 05 seconds W.

RANGE IN CHARACTERISTICS:
Depth to top of Argillic horizon: 5 to 15 inches
Depth to base of Argillic Horizon: 30 to 60 inches or more
Depth to Bedrock: Greater than 72 inches
Depth to Seasonal High Water Table: 18 to 42 inches, November to May
Rock Fragments: 0 to 20 percent, by volume throughout; mostly quartzite with occasional ironstone, mostly fine or medium in size. Some pedons have thin strata with 20 to 35 percent fragments in the subsoil.
Soil Reaction: Extremely acid to strongly acid throughout, unless limed
Stratified, black, or greenish black layers within the C horizon, may be ultra acid upon exposure to air.
Content of Glauconite: Weighted average of 2 to 20 percent pellets, by volume in the A horizon and more than 20 percent in the B and C horizons

RANGE OF INDIVIDUAL HORIZONS:

Ap or A horizons:
Color--hue of 5Y to 10YR, value of 3 or 4, chroma of 2 to 4
Texture (fine earth fraction):--sandy loam, fine sandy loam, loam, or silt loam

BA or BE horizons (if it occurs):
Color--hue of 5Y to 10YR, value of 4 to 6, chroma of 2 to 4
Texture (fine earth fraction)--sandy loam, fine sandy loam, loam, or silt loam

Bt horizons:
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 5GY to 5G, value of 2.5 to 6, and chroma of 1 or 2
Texture (fine earth fraction)--clay, sandy clay, or sandy clay loam
Redoximorphic features-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions of chroma 2 or less may occur within the lower Bt horizon below 24 inches from its upper boundary. In most pedons these depletions are difficult to distinguish due to the masking effects of the dark olive, and dark greenish parent materials.

BC horizon (if it occurs):
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 5GY to 5G, value of 2.5 to 6, and chroma of 1 or 2
Texture (fine earth fraction)--sandy clay, sandy clay loam, loam, or sandy loam
Redoximorphic features-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions of chroma 2 or less may occur within this layer.

In most pedons these depletions are difficult to distinguish due to the masking effects of the dark olive and dark greenish parent materials.

C horizon
Color--hue of 2.5Y or 5Y, value of 3 to 5, chroma 3 to 6, or 10Y to 5G, value of 2.5 to 6, and chroma of 1 or 2
Texture (fine earth fraction)--sandy loam, sandy clay loam, sandy clay, or clay, and is commonly stratified with sandy textures
Redoximorphic features (if they occur)-masses of oxidized iron in shades of red, yellow, brown, or olive, and iron depletions in shades of olive or brown. Gray or grayish brown iron depletions of chroma 2 or less may occur within this layer. In most pedons these depletions are difficult to distinguish due to the masking effects of the dark olive and dark greenish parent materials.

COMPETING SERIES:
Kresson soils-have a seasonal high water table at a depth of 12 to 18 inches (somewhat poorly drained); on slightly lower landforms

GEOGRAPHIC SETTING:
Landscape: Northern Atlantic Coastal Plain
Landform: Low hill, flat, depression
Geomorphic Component: Base slope
Hillslope Profile Position: Summit, backslope, footslope, rise
Parent Material: Clayey glauconite marine and/or fluviomarine deposits
Slope: 0 to 40 percent
Elevation: 25 to 170 feet
Frost Free Period: 180 to 210 days
Mean Annual Air Temperature: 50 to 56 degrees F.
Mean Annual Precipitation: 40 to 48 inches

GEOGRAPHICALLY ASSOCIATED SOILS:
Adelphia soils--are in a fine-loamy family, contain less than 20 percent weighted average glauconite pellets in the particle-size control section; on similar landforms
Colemantown soils-have a seasonal high water table at a depth of less than 12 inches (poorly drained;)on lower-lying landforms
Collington soils--have a seasonal high water table at a depth greater than 72 inches (well drained), have a fine-loamy family particle-size control section, and contain less than 20 percent glauconite pellets in the particle-size control section; on higher landforms
Colts Neck soils--have a seasonal high water table at a depth greater than 72 inches (well drained), are in a fine-loamy family, and contain less than 20 percent glauconite pellets in the particle-size control section; on higher landforms
Freehold soils--have a seasonal high water table at a depth greater than 72 inches (well drained), are in a fine-loamy family, and contain less than 10 percent glauconite pellets in the particle-size control section; on higher landforms
Kresson soils-have a seasonal high water table at a depth of 12 to 18 inches (somewhat poorly drained); on slightly lower landforms

DRAINAGE AND PERMEABILITY:
Depth Class: Very deep
Drainage Class (Agricultural): Moderately well drained
Internal Free Water Occurrence: Moderately deep (20 to 40 inches) and common (3 to 6 months)
Flooding Frequency and Duration: None
Ponding Frequency and Duration: None
Index Surface Runoff: Medium to very high

Permeability: Slow
Shrink-Swell Potential: Moderate

USE AND VEGETATION:
Major uses: Historically cleared and used for corn, tomatoes, soybeans, hay and pasture. However, in New Jersey most areas have rapidly become urbanized.
Dominant Vegetation: Wooded areas are dominantly mixed oaks, hickory, sweetgum, yellow-poplar, American beech, and red maple. Some southern areas in former agricultural uses have growth of Virginia pine and red cedar.

DISTRIBUTION AND EXTENT:
Distribution: The Northern Atlantic Coastal Plain of New Jersey and Maryland
Extent: Small

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Burlington County, New Jersey, 1936

REMARKS: This revision narrows the range of the original series concept to moderately well drained and sets the seasonal high water table at 18 to 42 inches below the surface. This revision also relocates the series concept to Gloucester County, New Jersey. It is believed that Marlton soils have aquic conditions and episaturation. The classification of these soils as Aquic Hapludults is based on evidence of wetness other than low chroma. Low chroma mottles which are normal in other moderately well drained soils are rare in these soils. For this reason the depth to, extent and distinctness of high chroma mottles have been used so as to group these soils with soils of similar natural drainage.

Diagnostic horizons and other soil characteristics recognized in this pedon are:
Ochric epipedon--the zone from the soil surface to a depth of 10 inches (Ap horizon).
Argillic horizon--the zone from 10 to 47 inches (Bt1, Bt2, Bt3 horizons)
Aquic conditions--the soil has periodic saturation and reduction (episaturation) within the upper 24 inches of the argillic horizon, and one or more unsaturated layers within 78 inches of the surface, occurring below the periodically saturated zone.

Other soil features identified with this pedon:
Very high glauconite content feature--averaging 20 percent pellets, by weight in the fine-earth fraction within the mineralogy control section (10-30 inch) zone (Bt1, Bt2, Bt3 horizons)
Series Control Section-the zone from 0 to 60 inches

ADDITIONAL DATA: The following pedons are available from the NRCS-Survey Laboratory, Lincoln, NE: S91NJ-033-001 and S75NJ-005-001

Database Information:
OSD Data Mapunit ID: To be developed
Typical Pedon Data Mapunit ID: 407411
OSD User Pedon ID: Marlton-OSD

TABULAR SERIES DATA:

SOI-5	Soil Name	Slope	Airtemp	FrFr/Seas	Precip	Elevation
NJ0042	Marlton	0-40	50-56	180-210	40-48	25-170

SOI-5	FloodL	FloodH	Watertable	Kind	Months	Bedrock	Hardness
NJ0042	NONE	NONE	1.5-3.5	PERCHED	DEC-MAY	>72	

SOI-5	Depth	Texture	3-Inch	No-10	Clay%	-CEC-
NJ0042	0-10	FSL SL L	-	80-100	10-25	-
NJ0042	10-40	SC SCL C	-	80-100	30-45	-
NJ0042	40-60	SR SL C	-	80-100	15-45	-

SOI-5	Depth	PH	O.M.	Salin	Permeab	Shnk-Swll
NJ0042	0-10	4.5-5.5	2.-3.	0-0	0.6-6.0	LOW
NJ0042	10-40	4.5-5.5	-	0-0	0.06-0.2	MODERATE
NJ0042	40-60	4.5-5.5	-	0-0	0.06-2.0	LOW

National Cooperative Soil Survey
U.S.A.

State Soil Data Access (SDA) Hydric Soils List

An SDA-populated select list is used to pick a state and SSA which enables creation of a "Hydric Soils Report" based upon those selections. The data is not static; it hits Soil Data Access Live. To reset the table hit F5 on the keyboard. Once a survey is selected and table appears, if a new survey is selected it will append to the table at the bottom. For more information about the table,

Report Metadata: Back to top

- **Area_Symbol:** A symbol that uniquely identifies a single occurrence of a particular type of area (e.g. Dane Co., Wisconsin is WI025).
- **Area_Name:** The name given to the specified geographic area.
- **mukey:** A non-connotative string of characters used to uniquely identify a record in the Mapunit table.
- **Mapunit_SYM:** The symbol used to uniquely identify the soil mapunit in the soil survey.
- **Mapunit_Name:** Correlated name of the mapunit (recommended name or field name for surveys in progress).
- **Comp_Name_phase:** Component name - Name assigned to a component based on its range of properties. Local Phase - Phase criterion to be used at a local level, in conjunction with "component name" to help identify a soil component.
- **muacres:** The number of acres of a particular mapunit.
- **Comp_RV_Pct:** The percentage of the component of the mapunit.
- **majcompflag:** Indicates whether or not a component is a major component in the mapunit.
- **Comp_Acres:** The number of acres of a particular component in a mapunit. ((muacres*comppct_r)/100)
- **Comp_Landform:** A word or group of words used to name a feature on the earth's surface, expressed in the plural form. Column Physical
- **Hydric_Rating:** A yes/no field that indicates whether or not a map unit component is classified as a "hydric soil". If rated as hydric, the specific criteria met are listed in the Component Hydric Criteria table.
- **Hydric_criteria:** Criterion code for the soil characteristic(s) and/or feature(s) that cause the map unit component to be classified as a "hydric soil." These codes are the paragraph numbers in the hydric soil criteria publication.

Criteria:

1. All Histels except Folistels and Histosols except Folists; or
2. Map unit components in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, or Andic, Cumulic, Pachic, or Vitrandic subgroups that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil;
3. Map unit components that are frequently ponded for long duration or very long duration during the growing season that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil; or
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soils meet the definition of a hydric soil.

State Sym	Area Symbol	Area_Name	mukey	Mapunit SYM	Mapunit_Name	Comp_Name_phase	muacres	Comp RV_Pct	Maj Comp flag	Comp Acres	Comp Landform	Micro-feature	Hydric Rating	Hydric criteria
NJ	NJ005	Burlington County, New Jersey	697629	AdmA	Adelphia fine sandy loam, 0 to 2 percent slopes	Shrewsbury	7045	5	No	352	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697630	AdmB	Adelphia fine sandy loam, 2 to 5 percent slopes	Shrewsbury	2523	5	No	126	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697631	AdmkA	Adelphia fine sandy loam, clayey substratum, 0 to 2 percent slopes	Shrewsbury	978	5	No	48	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697632	AdmkB	Adelphia fine sandy loam, clayey substratum, 2 to 5 percent slopes	Shrewsbury	544	5	No	27	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	824999	AdmmA	Adelphia high glauconite variant fine sandy loam, 0 to 2 percent slopes	Shrewsbury	2124	5	No	106	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	824999	AdmmA	Adelphia high glauconite variant fine sandy loam, 0 to 2 percent slopes	Colemantown, occasionally flooded	2124	5	No	106	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	825000	AdmmB	Adelphia high glauconite variant fine sandy loam, 2 to 5 percent slopes	Shrewsbury	866	5	No	43	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697635	AdnA	Adelphia loam, 0 to 2 percent slopes	Shrewsbury	649	5	No	32	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697636	AdnB	Adelphia loam, 2 to 5 percent slopes	Shrewsbury	8	5	No	0	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697637	AdotB	Adelphia sandy clay loam, truncated, 0 to 5 percent slopes	Shrewsbury	618	5	No	30	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697638	AdpB	Adelphia-Urban land complex, 0 to 5 percent slopes	Shrewsbury	372	5	No	18	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777780	AtsAO	Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area	Atsion	44833	90	Yes	40349	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777780	AtsAO	Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area	Berryland, occasionally flooded	44833	5	No	2241	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777781	AtshA	Atsion sand, loamy substratum, 0 to 2 percent slopes	Atsion, loamy substratum	8057	90	Yes	7251	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777781	AtshA	Atsion sand, loamy substratum, 0 to 2 percent slopes	Berryland, occasionally flooded	8057	5	No	402	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777782	AttA	Atsion fine sand, 0 to 2 percent slopes	Atsion	11547	90	Yes	10392	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777782	AttA	Atsion fine sand, 0 to 2 percent slopes	Berryland, occasionally flooded	11547	5	No	577	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777783	AtthA	Atsion fine sand, loamy substratum, 0 to 2 percent slopes	Atsion, loamy substratum	981	90	Yes	882	depressions	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	777783	AtthA	Atsion fine sand, loamy substratum, 0 to 2 percent slopes	Berryland, occasionally flooded	981	5	No	49	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777784	AttxAr	Atsion-Berryland sands, 0 to 2 percent slopes, rarely flooded	Atsion, rarely flooded	15	60	Yes	9	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777784	AttxAr	Atsion-Berryland sands, 0 to 2 percent slopes, rarely flooded	Berryland, rarely flooded	15	40	Yes	6	depressions	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777785	BerAr	Berryland sand, 0 to 2 percent slopes, rarely flooded	Berryland, rarely flooded	18	85	Yes	15	depressions, drainageways, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777785	BerAr	Berryland sand, 0 to 2 percent slopes, rarely flooded	Manahawkin, frequently flooded	18	5	No	0	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	777785	BerAr	Berryland sand, 0 to 2 percent slopes, rarely flooded	Mullica, rarely flooded	18	5	No	0	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777785	BerAr	Berryland sand, 0 to 2 percent slopes, rarely flooded	Atsion	18	5	No	0	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777786	BerAs	Berryland sand, 0 to 2 percent slopes, occasionally flooded	Berryland, occasionally flooded	1496	85	Yes	1271	depressions, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777786	BerAs	Berryland sand, 0 to 2 percent slopes, occasionally flooded	Mullica, rarely flooded	1496	5	No	74	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777786	BerAs	Berryland sand, 0 to 2 percent slopes, occasionally flooded	Manahawkin, frequently flooded	1496	5	No	74	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	777786	BerAs	Berryland sand, 0 to 2 percent slopes, occasionally flooded	Atsion	1496	5	No	74	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777787	BerAt	Berryland sand, 0 to 2 percent slopes, frequently flooded	Berryland, frequently flooded	145	85	Yes	123	depressions, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777787	BerAt	Berryland sand, 0 to 2 percent slopes, frequently flooded	Manahawkin, frequently flooded	145	5	No	7	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	777787	BerAt	Berryland sand, 0 to 2 percent slopes, frequently flooded	Mullica, rarely flooded	145	5	No	7	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777787	BerAt	Berryland sand, 0 to 2 percent slopes, frequently flooded	Atsion	145	5	No	7	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777788	BesAs	Berryland mucky sand, 0 to 2 percent slopes, occasionally flooded	Berryland, occasionally flooded	4817	85	Yes	4094	depressions, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	777788	BesAs	Berryland mucky sand, 0 to 2 percent slopes, occasionally flooded	Atsion	4817	5	No	240	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	777788	BesAs	Berryland mucky sand, 0 to 2 percent slopes, occasionally flooded	Manahawkin, frequently flooded	4817	5	No	240	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	777788	BesAs	Berryland mucky sand, 0 to 2 percent slopes, occasionally flooded	Mullica, rarely flooded	4817	5	No	240	depressions, drainageways, flood plains	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	784256	BetAs	Berryland fine sand, 0 to 2 percent slopes, occasionally flooded	Berryland, occasionally flooded	1790	85	Yes	1521	depressions, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	784256	BetAs	Berryland fine sand, 0 to 2 percent slopes, occasionally flooded	Mullica, rarely flooded	1790	5	No	89	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	784256	BetAs	Berryland fine sand, 0 to 2 percent slopes, occasionally flooded	Atsion	1790	5	No	89	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	784256	BetAs	Berryland fine sand, 0 to 2 percent slopes, occasionally flooded	Manahawkin, frequently flooded	1790	5	No	89	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	697662	BugA	Buddtown loamy fine sand, 0 to 2 percent slopes	Jade Run	2372	5	No	118	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697663	BugB	Buddtown loamy fine sand, 2 to 5 percent slopes	Jade Run	411	5	No	20	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697664	BuhA	Buddtown fine sandy loam, 0 to 2 percent slopes	Jade Run	2907	5	No	145	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697665	BuhB	Buddtown fine sandy loam, 2 to 5 percent slopes	Jade Run	650	5	No	32	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	731320	BukA	Buddtown-Deptford loamy fine sands, 0 to 2 percent slopes	Jade Run	59	5	No	2	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	731318	BumA	Buddtown-Deptford complex, 0 to 2 percent slopes	Jade Run	87	5	No	4	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778221	CoeAs	Colemantown loam, 0 to 2 percent slopes, occasionally flooded	Colemantown, occasionally flooded	4523	90	Yes	4070	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	697675	CokB	Collington sandy loam, 2 to 5 percent slopes	Shrewsbury, undrained	229	4	No	9	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697678	ComB	Collington fine sandy loam, 2 to 5 percent slopes	Shrewsbury, undrained	6595	4	No	263	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697681	ConB	Collington loam, 2 to 5 percent slopes	Shrewsbury, undrained	253	4	No	10	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697686	DoaA	Donlonton fine sandy loam, 0 to 2 percent slopes	Shrewsbury	470	5	No	23	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697688	DobA	Donlonton loam, 0 to 2 percent slopes	Shrewsbury	1571	5	No	78	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	2955529	DocB	Downer loamy sand, 0 to 5 percent slopes, Northern Coastal Plain	Atsion	null	5	No	null	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697690	DocBO	Downer loamy sand, 0 to 5 percent slopes, Northern Tidewater Area	Atsion	null	5	No	null	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697701	EveB	Evesboro sand, 0 to 5 percent slopes	Atsion	12646	5	No	632	flats	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	697701	EveB	Evesboro sand, 0 to 5 percent slopes	Mullica, rarely flooded	12646	5	No	632	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778222	FanA	Fallsington fine sandy loam, 0 to 2 percent slopes	Fallsington	1911	90	Yes	1719	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778222	FanA	Fallsington fine sandy loam, 0 to 2 percent slopes	Mullica	1911	5	No	95	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778223	FankA	Fallsington fine sandy loam, clayey substratum, 0 to 2 percent slopes	Fallsington, clayey substratum	631	90	Yes	567	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778223	FankA	Fallsington fine sandy loam, clayey substratum, 0 to 2 percent slopes	Mullica	631	5	No	31	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778224	FmgAt	Fluvaquents, sandy, 0 to 3 percent slopes, frequently flooded	Fluvaquents, sandy, frequently flooded	12907	85	Yes	10970	flood plains	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	778224	FmgAt	Fluvaquents, sandy, 0 to 3 percent slopes, frequently flooded	Atsion, rarely flooded	12907	5	No	645	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778224	FmgAt	Fluvaquents, sandy, 0 to 3 percent slopes, frequently flooded	Berryland, occasionally flooded	12907	5	No	645	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	778224	FmgAt	Fluvaquents, sandy, 0 to 3 percent slopes, frequently flooded	Manahawkin, frequently flooded	12907	5	No	645	flood plains	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	778225	FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	Fluvaquents, loamy, frequently flooded	10093	10	No	1009	flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697724	FrfB	Freehold loamy sand, 0 to 5 percent slopes	Shrewsbury	3931	5	No	196	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697726	FrkB	Freehold sandy loam, 2 to 5 percent slopes	Shrewsbury	7	5	No	0	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697742	GahB	Galloway sand, 0 to 5 percent slopes	Atsion	3499	5	No	174	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697743	GahhB	Galloway sand, loamy substratum, 0 to 5 percent slopes	Atsion	605	5	No	30	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697744	GakB	Galloway fine sand, 0 to 5 percent slopes	Atsion	4534	5	No	226	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697745	GamB	Galloway loamy sand, 0 to 5 percent slopes	Atsion	79	5	No	3	drainageways, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697745	GamB	Galloway loamy sand, 0 to 5 percent slopes	Mullica, rarely flooded	79	5	No	3	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697747	HbmB	Hammonton loamy sand, 0 to 5 percent slopes	Atsion	175	5	No	8	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697747	HbmB	Hammonton loamy sand, 0 to 5 percent slopes	Fallsington	175	5	No	8	depressions, flats	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	697747	HbmB	Hammonton loamy sand, 0 to 5 percent slopes	Mullica, rarely flooded	175	5	No	8	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697748	HbmkB	Hammonton loamy sand, clayey substratum, 0 to 5 percent slopes	Mullica, rarely flooded	799	5	No	39	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697748	HbmkB	Hammonton loamy sand, clayey substratum, 0 to 5 percent slopes	Atsion	799	5	No	39	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697749	HboA	Hammonton sandy loam, 0 to 2 percent slopes	Fallsington	6	5	No	0	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697749	HboA	Hammonton sandy loam, 0 to 2 percent slopes	Mullica, rarely flooded	6	5	No	0	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697749	HboA	Hammonton sandy loam, 0 to 2 percent slopes	Atsion, rarely flooded	6	5	No	0	drainageways, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697756	HoaB	Holmdel loamy sand, 0 to 5 percent slopes	Shrewsbury	4058	5	No	202	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697757	HocA	Holmdel sandy loam, 0 to 2 percent slopes	Shrewsbury	8	5	No	0	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697758	HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	Atsion	8428	5	No	421	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697758	HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	Shrewsbury	8428	5	No	421	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697759	HodB	Holmdel fine sandy loam, 2 to 5 percent slopes	Shrewsbury	2784	5	No	139	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697760	HodkA	Holmdel fine sandy loam, clayey substratum, 0 to 2 percent slopes	Shrewsbury	1379	5	No	68	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697761	HodkB	Holmdel fine sandy loam, clayey substratum, 2 to 5 percent slopes	Shrewsbury	1539	5	No	76	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697762	HofB	Holmdel-Urban land complex, 0 to 5 percent slopes	Shrewsbury	1418	5	No	70	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778226	HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	Humaquepts, frequently flooded	129	85	Yes	109	flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778226	HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	Manahawkin, frequently flooded	129	5	No	6	flood plains	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	778226	HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	Mullica, occasionally flooded	129	5	No	6	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778226	HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	Atsion	129	5	No	6	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697764	JdrA	Jade Run fine sandy loam, 0 to 2 percent slopes	Jade Run	4122	90	Yes	3709	depressions, flats	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	697764	JdrA	Jade Run fine sandy loam, 0 to 2 percent slopes	Mullica	4122	5	No	206	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778228	KeaA	Keansburg fine sandy loam, 0 to 2 percent slopes	Keansburg	2168	85	Yes	1842	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778228	KeaA	Keansburg fine sandy loam, 0 to 2 percent slopes	Shrewsbury	2168	5	No	108	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697770	KeoA	Keyport loam, 0 to 2 percent slopes	Fallsington	886	5	No	44	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697770	KeoA	Keyport loam, 0 to 2 percent slopes	Elkton	886	5	No	44	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697770	KeoA	Keyport loam, 0 to 2 percent slopes	Lenni	886	5	No	44	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697771	KeoB	Keyport loam, 2 to 5 percent slopes	Fallsington	1336	5	No	66	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697771	KeoB	Keyport loam, 2 to 5 percent slopes	Lenni	1336	5	No	66	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697771	KeoB	Keyport loam, 2 to 5 percent slopes	Elkton	1336	5	No	66	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697785	KrbA	Kresson loamy sand, 0 to 5 percent slopes	Colemantown, occasionally flooded	542	5	No	27	depressions, drainageways	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697786	KreA	Kresson fine sandy loam, 0 to 2 percent slopes	Colemantown, occasionally flooded	2246	5	No	112	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	697786	KreA	Kresson fine sandy loam, 0 to 2 percent slopes	Shrewsbury	2246	5	No	112	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697787	KrhA	Kresson loam, 0 to 2 percent slopes	Shrewsbury	754	5	No	37	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697787	KrhA	Kresson loam, 0 to 2 percent slopes	Colemantown, occasionally flooded	754	5	No	37	depressions, drainageways	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697792	LakB	Lakehurst sand, 0 to 5 percent slopes	Atsion, rarely flooded	35890	5	No	1794	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697792	LakB	Lakehurst sand, 0 to 5 percent slopes	Berryland, rarely flooded	35890	5	No	1794	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	697793	LakfB	Lakehurst sand, thick surface, 0 to 5 percent slopes	Atsion	10087	5	No	504	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697794	LakhB	Lakehurst sand, loamy substratum, 0 to 5 percent slopes	Atsion	6420	5	No	321	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697795	LamB	Lakehurst fine sand, 0 to 5 percent slopes	Atsion	8149	5	No	407	depressions, flats	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	697796	LamkB	Lakehurst fine sand, loamy substratum, 0 to 5 percent slopes	Atsion	1923	5	No	96	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697799	LasB	Lakewood sand, 0 to 5 percent slopes	Atsion, rarely flooded	20128	5	No	1006	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697800	LasC	Lakewood sand, 5 to 10 percent slopes	Atsion, rarely flooded	2292	5	No	114	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697801	LasD	Lakewood sand, 10 to 15 percent slopes	Atsion	300	5	No	15	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697802	LasfB	Lakewood sand, thick surface, 0 to 5 percent slopes	Atsion	2552	5	No	127	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697803	LashB	Lakewood sand, loamy substratum, 0 to 5 percent slopes	Atsion	9678	5	No	483	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697804	LatB	Lakewood fine sand, 0 to 5 percent slopes	Atsion	3643	5	No	182	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697806	LathB	Lakewood fine sand, loamy substratum, 0 to 5 percent slopes	Atsion	1383	5	No	69	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778229	MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	Manahawkin, frequently flooded	16148	85	Yes	13725	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	778229	MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	Atsion	16148	5	No	807	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778229	MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	Mullica, rarely flooded	16148	5	No	807	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778229	MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	Berryland, occasionally flooded	16148	5	No	807	depressions, drainageways, flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	778230	MamnAv	Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently flooded	Mannington, very frequently flooded	2277	55	Yes	1252	tidal marshes	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778230	MamnAv	Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently flooded	Nanticoke, very frequently flooded	2277	35	Yes	796	tidal marshes	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778231	MamuAv	Mannington-Nanticoke-Udorthents complex, 0 to 1 percent slopes, very frequently flooded	Mannington, very frequently flooded	191	40	Yes	76	tidal marshes	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	778231	MamuAv	Mannington-Nanticoke-Udorthents complex, 0 to 1 percent slopes, very frequently flooded	Nanticoke, very frequently flooded	191	35	Yes	66	tidal marshes	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697836	MunA	Mullica fine sandy loam, 0 to 2 percent slopes	Mullica	6281	90	Yes	5652	flats	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	697836	MunA	Mullica fine sandy loam, 0 to 2 percent slopes	Fallsington	6281	5	No	314	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697837	MunhA	Mullica fine sandy loam, loamy substratum, 0 to 2 percent slopes	Mullica, loamy substratum	2	80	Yes	1	flats	null	Yes	2

NJ	NJ005	Burlington County, New Jersey	697837	MunhA	Mullica fine sandy loam, loamy substratum, 0 to 2 percent slopes	Manahawkin, frequently flooded	2	5	No	0	flood plains, swamps	null	Yes	1, 3
NJ	NJ005	Burlington County, New Jersey	697854	SacA	Sassafras sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	Fallsington, drained	1243	4	No	49	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697855	SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	Fallsington, drained	1049	4	No	41	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697871	ShrA	Shrewsbury sandy loam, 0 to 2 percent slopes	Shrewsbury	8	85	Yes	6	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697871	ShrA	Shrewsbury sandy loam, 0 to 2 percent slopes	Fallsington	8	3	No	0	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697871	ShrA	Shrewsbury sandy loam, 0 to 2 percent slopes	Mullica	8	3	No	0	depressions, drainageways, flood plains	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697872	ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	Shrewsbury	6767	85	Yes	5751	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697872	ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	Keansburg	6767	5	No	338	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697873	ShskA	Shrewsbury fine sandy loam, clayey substratum, 0 to 2 percent slopes	Shrewsbury, clayey substratum	1171	85	Yes	995	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697873	ShskA	Shrewsbury fine sandy loam, clayey substratum, 0 to 2 percent slopes	Keansburg	1171	5	No	58	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697875	ShtA	Shrewsbury loam, 0 to 2 percent slopes	Shrewsbury	863	85	Yes	733	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697875	ShtA	Shrewsbury loam, 0 to 2 percent slopes	Keansburg	863	5	No	43	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697876	ShuA	Shrewsbury sandy clay loam, truncated, 0 to 2 percent slopes	Shrewsbury, truncated	195	85	Yes	165	flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697876	ShuA	Shrewsbury sandy clay loam, truncated, 0 to 2 percent slopes	Keansburg	195	5	No	9	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697874	ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes	Shrewsbury, ironstone substratum	934	85	Yes	793	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697874	ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes	Keansburg	934	5	No	46	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	698730	TrkAv	Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded	Transquaking, very frequently flooded	7471	90	Yes	6723	tidal marshes	null	Yes	1
NJ	NJ005	Burlington County, New Jersey	698730	TrkAv	Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded	Broadkill, very frequently flooded	7471	5	No	373	tidal marshes	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	698730	TrkAv	Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded	Appoquinimink, very frequently flooded	7471	5	No	373	tidal marshes	null	Yes	2, 3
NJ	NJ005	Burlington County, New Jersey	778235	UdkB	Udorthents, loamy, 0 to 8 percent slopes	Parsippany	12	5	No	0	outwash plains	null	Yes	2, 3

NJ	NJ005	Burlington County, New Jersey	778237	UdoB	Udorthents, organic substratum, 0 to 8 percent slopes	Pawcatuck, very frequently flooded	51	5	No	2	tidal marshes	null	Yes	null
NJ	NJ005	Burlington County, New Jersey	778232	UdwB	Udorthents, wet substratum, 0 to 8 percent slopes	Transquaking, very frequently flooded	245	1	No	2	tidal marshes	null	Yes	1
NJ	NJ005	Burlington County, New Jersey	778232	UdwB	Udorthents, wet substratum, 0 to 8 percent slopes	Pawcatuck, very frequently flooded	245	1	No	2	tidal marshes	null	Yes	null
NJ	NJ005	Burlington County, New Jersey	697920	WeeB	Westphalia fine sandy loam, 2 to 5 percent slopes	Jade Run	1243	5	No	62	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697929	WobB	Woodmansie sand, 0 to 5 percent slopes	Atsion, rarely flooded	14850	2	No	297	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697931	WobhB	Woodmansie sand, loamy substratum, 0 to 5 percent slopes	Atsion, rarely flooded	4295	2	No	85	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697932	WobmB	Woodmansie sand, firm substratum, 0 to 5 percent slopes	Atsion, rarely flooded	1400	2	No	28	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697933	WodB	Woodstown loamy sand, 0 to 5 percent slopes	Fallsington	4030	5	No	201	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697934	WodhB	Woodstown loamy sand, loamy substratum, 0 to 5 percent slopes	Fallsington	329	5	No	16	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697935	WofA	Woodstown fine sandy loam, 0 to 2 percent slopes	Fallsington	4592	5	No	229	depressions	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697937	WofkA	Woodstown fine sandy loam, clayey substratum, 0 to 2 percent slopes	Fallsington, clayey substratum	3217	5	No	160	depressions, flats	null	Yes	2
NJ	NJ005	Burlington County, New Jersey	697938	WofkB	Woodstown fine sandy loam, clayey substratum, 2 to 5 percent slopes	Fallsington, clayey substratum	3072	5	No	153	depressions, flats	null	Yes	2

SOIL SURVEY

Burlington County New Jersey

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
Issued October 1971

BURLINGTON COUNTY, NEW JERSEY — SHEET NUMBER 37

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the New Jersey Agricultural Experiment Station.
Photo base from 1963 aerial photographs. 5,000-foot grid ticks based on New Jersey plane coordinate system. 1927 North American datum

BURLINGTON COUNTY, NEW JERSEY NO. 37

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The suitability of the soils for use as cropland is discussed in the soil descriptions. The capability classification is discussed on pages 54 through 56. For information on use of soils for woodland, see section beginning on page 56, including table 4, page 58. Other information is given in tables as follows:

Acreage and extent, table 1, page 8.
Estimated yields, table 2, page 53.
Use of soils for wildlife, table 5, page 62.
Engineering uses of soils, tables 6, 7, and 8, pages 66 through 99.
Limitations of soils for recreational and community developments, table 9, page 102.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
AaA	Adelphia fine sandy loam, 0 to 2 percent slopes	10	IIw-14	2w1
AaB	Adelphia fine sandy loam, 2 to 5 percent slopes	10	IIw-14	2w1
AcA	Adelphia fine sandy loam, clayey substratum, 0 to 2 percent slopes	10	IIw-14	2w1
AcB	Adelphia fine sandy loam, clayey substratum, 2 to 5 percent slopes	10	IIw-14	2w1
AhA	Adelphia loam, 0 to 2 percent slopes	10	IIw-13	2w1
Ak	Adelphia sandy clay loam, truncated	10	IIw-13	2w1
AnA	Adelphia fine sandy loam, glauconitic variant, 0 to 2 percent slopes	11	IIw-14	2w1
AnB	Adelphia fine sandy loam, glauconitic variant, 2 to 5 percent slopes	11	IIw-14	2w1
Ao	Alluvial land, loamy	11	VIw-28	1w1
Ap	Alluvial land, sandy	12	VIw-28	3w1
At	Atsion sand	13	Vw-22	3w1
Au	Atsion sand, loamy substratum	13	Vw-22	3w1
Av	Atsion fine sand	13	Vw-22	3w1
Aw	Atsion fine sand, loamy substratum	13	Vw-22	3w1
Bp	Berryland sand	15	Vw-26	3w1
Bt	Berryland fine sand	15	Vw-26	3w1
Bu	Berryland mucky sand	15	Vw-26	3w1
Cm	Colemantown loam	16	IIIw-20	3w2
CnA	Collington fine sandy loam, 0 to 2 percent slopes	17	I-5	1o1
CnB	Collington fine sandy loam, 2 to 5 percent slopes	17	IIe-5	1o1
CnC	Collington fine sandy loam, 5 to 10 percent slopes	17	IIIe-5	1o1
CoA	Collington loam, 0 to 2 percent slopes	17	I-4	1o1
CoB	Collington loam, 2 to 5 percent slopes	17	IIe-4	1o1
DeB	Donlonton fine sandy loam, 0 to 3 percent slopes	18	IIw-12	2w1
DlA	Donlonton loam, 0 to 3 percent slopes	18	IIw-11	2w1
DoA	Downer loamy sand, 0 to 2 percent slopes	19	IIs-6	3o1
DoB	Downer loamy sand, 2 to 5 percent slopes	19	IIs-6	3o1
DoC	Downer loamy sand, 5 to 10 percent slopes	19	IIIe-6	3o1
DpB	Downer loamy sand, gravelly substratum, 0 to 5 percent slopes	19	IIs-6	3o1
DrA	Downer loamy sand, loamy substratum, 0 to 2 percent slopes	19	IIs-6	3o1
DsB	Downer sandy loam, truncated, 0 to 5 percent slopes	20	IIIe-6	3o1
EvB	Evesboro sand, 0 to 5 percent slopes	20	VIIs-7	3s1
EvC	Evesboro sand, 5 to 10 percent slopes	20	VIIs-7	3s1
EwB	Evesboro sand, loamy substratum, 0 to 5 percent slopes	20	IVs-7	3s1
EyB	Evesboro fine sand, 0 to 5 percent slopes	20	IVs-7	3s1
Fa	Fallsington fine sandy loam	21	IIIw-21	3w2
Fc	Fallsington fine sandy loam, clayey substratum	21	IIIw-21	3w2
FfA	Freehold fine sandy loam, 0 to 2 percent slopes	22	I-5	1o1
FfB	Freehold fine sandy loam, 2 to 5 percent slopes	22	IIe-5	1o1
FfC	Freehold fine sandy loam, 5 to 10 percent slopes	23	IIIe-5	1o1
FfD	Freehold fine sandy loam, 10 to 15 percent slopes	23	IVe-5	1o1
FfE	Freehold fine sandy loam, 15 to 25 percent slopes	23	VIe-5	1r1
FgB	Freehold fine sandy loam, clayey substratum, 2 to 5 percent slopes	23	IIe-5	1o1

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GUIDE TO MAPPING UNITS.--Continued

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
FhB	Freehold loamy sand, 0 to 5 percent slopes	23	IIs-6	2o1
FhC	Freehold loamy sand, 5 to 10 percent slopes	23	IIIe-6	2o1
FoC3	Freehold sandy loam, 5 to 10 percent slopes, severely eroded	23	IVe-5	1o1
FoD3	Freehold sandy loam, 10 to 15 percent slopes, severely eroded	23	VIe-5	1o1
GaA	Galestown sand, 0 to 5 percent slopes	24	IVs-7	3s1
GcB	Galestown sand, clayey substratum, 0 to 5 percent slopes	24	IVs-7	3s1
HdA	Holmdel fine sandy loam, 0 to 2 percent slopes	25	IIw-14	2w1
HdB	Holmdel fine sandy loam, 2 to 5 percent slopes	25	IIw-14	2w1
HlB	Holmdel loamy sand, 0 to 5 percent slopes	25	IIIw-15	2w1
HmA	Holmdel fine sandy loam, clayey substratum, 0 to 2 percent slopes	26	IIw-14	2w1
HmB	Holmdel fine sandy loam, clayey substratum, 2 to 5 percent slopes	26	IIw-14	2w1
Hn	Holmdel-Urban land complex	26	-----	---
Ka	Keansburg fine sandy loam	27	IIIw-25	3w2
KeB	Keyport loamy sand, 0 to 5 percent slopes	28	IIe-3	2w1
KfB	Keyport fine sandy loam, 2 to 5 percent slopes	28	IIe-2	2w1
KlA	Keyport loam, 0 to 2 percent slopes	28	IIw-1	2w1
KlB	Keyport loam, 2 to 5 percent slopes	28	IIe-1	2w1
KlC	Keyport loam, 5 to 10 percent slopes	28	IIIe-1	2w1
KlD	Keyport loam, 10 to 15 percent slopes	28	VIe-1	2w1
KlE	Keyport loam, 15 to 25 percent slopes	28	VIIe-1	2r1
KmA	Klej sand, 0 to 4 percent slopes	29	IIIw-16	3s1
KnA	Klej sand, loamy substratum, 0 to 2 percent slopes	29	IIIw-16	3s1
KoA	Klej fine sand, 0 to 2 percent slopes	30	IIIw-16	3s1
KwA	Kresson loamy sand, 0 to 3 percent slopes	31	IIIw-12	2w1
KxA	Kresson fine sandy loam, 0 to 3 percent slopes	31	IIIw-12	2w1
KyA	Kresson loam, 0 to 3 percent slopes	31	IIIw-11	2w1
LaA	Lakehurst sand, 0 to 3 percent slopes	32	IVw-17	4s1
LlA	Lakehurst sand, thick surface, 0 to 3 percent slopes	32	IVw-17	4s1
LmA	Lakehurst sand, loamy substratum, 0 to 3 percent slopes	32	IVw-17	4s1
LnA	Lakehurst fine sand, 0 to 3 percent slopes	32	IVw-17	4s1
LoA	Lakehurst fine sand, loamy substratum, 0 to 3 percent slopes	33	IVw-17	4s1
LrA	Lakehurst-Lakewood sands, 0 to 5 percent slopes	33	IVw-17	4s1
LsA	Lakehurst-Lakewood sands, loamy substratum, 0 to 5 percent slopes	33	IVw-17	4s1
LtB	Lakewood sand, 0 to 5 percent slopes	34	VIIs-8	5s1
LtC	Lakewood sand, 5 to 10 percent slopes	34	VIIs-8	5s1
LtD	Lakewood sand, 10 to 15 percent slopes	34	VIIs-8	5s1
LuB	Lakewood sand, thick surface, 0 to 5 percent slopes	34	VIIs-8	5s1
LvB	Lakewood sand, loamy substratum, 0 to 5 percent slopes	34	VIIs-8	5s1
LwB	Lakewood fine sand, 0 to 5 percent slopes	34	VIIs-8	5s1
LyA	Lakewood fine sand, loamy substratum, 0 to 5 percent slopes	34	VIIs-8	5s1
Ma	Made land, dredged coarse material	34	-----	---
Mf	Made land, dredged fine material	35	-----	---
Mg	Made land, sanitary fill	35	-----	---
MhA	Marlton fine sandy loam, 0 to 2 percent slopes	36	IIs-2	2o1
MhB	Marlton fine sandy loam, 2 to 5 percent slopes	36	IIe-2	2o1
MrC	Marlton soils, 5 to 10 percent slopes	36	IIIe-2	2o1
Ms	Marsh, fresh water	37	VIIIw-29	---
Mt	Marsh, tidal	37	VIIIw-29	---
Mu	Muck, shallow	37	VIIw-30	3w3
NbA	Nixonton fine sandy loam, 0 to 2 percent slopes	39	IIw-14	2w1
NbB	Nixonton fine sandy loam, 2 to 5 percent slopes	39	IIw-14	2w1

GUIDE TO MAPPING UNITS.--Continued

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
NcA	Nixonton loamy fine sand, 0 to 2 percent slopes	39	IIw-15	2w1
NcB	Nixonton loamy fine sand, 2 to 5 percent slopes	39	IIw-15	2w1
Pa	Pasquotank fine sandy loam	40	IIIw-20	3w2
PbA	Pemberton sand, 0 to 5 percent slopes	41	IIIw-15	3s1
PcA	Pemberton sand, thick surface, 0 to 5 percent slopes	41	IIIw-16	3s1
Pt	Pits, sand and gravel	41	-----	---
Pu	Pits, clay and marl	41	-----	---
Pv	Pocomoke fine sandy loam	42	IIIw-24	3w2
Se	Sandy land, ironstone	42	VIIs-8	3s1
SfB	Sassafras loamy sand, 0 to 5 percent slopes	43	IIs-6	2o1
SgA	Sassafras fine sandy loam, 0 to 2 percent slopes	44	I-5	2o1
SgB	Sassafras fine sandy loam, 2 to 5 percent slopes	44	IIe-5	2o1
SgC	Sassafras fine sandy loam, 5 to 10 percent slopes	44	IIIe-5	2o1
ShA	Sassafras fine sandy loam, clayey substratum, 0 to 2 percent slopes	44	I-5	2o1
ShB	Sassafras fine sandy loam, clayey substratum, 2 to 5 percent slopes	44	IIe-5	2o1
Sk	Sassafras-Urban land complex	45	-----	---
Sm	Sassafras-Urban land complex, clayey substrata	45	-----	---
Sn	Shrewsbury fine sandy loam	46	IIIw-21	3w2
So	Shrewsbury fine sandy loam, clayey substratum	46	IIIw-21	3w2
Sp	Shrewsbury loam	46	IIIw-20	3w2
Sv	Shrewsbury sandy clay loam, truncated	46	IIIw-20	3w2
Sx	Shrewsbury fine sandy loam, ironstone variant	47	IVw-21	3w2
TsB	Tinton sand, 0 to 5 percent slopes	47	IIIs-6	3s1
TsC	Tinton sand, 5 to 10 percent slopes	48	IVs-7	3s1
TtB	Tinton sand, thick surface, 0 to 5 percent slopes	48	IVs-7	3s1
Ug	Urban land, sandy	48	-----	---
Ut	Urban land, clayey	48	-----	---
Uv	Urban land, sandy over clayey	48	-----	---
WaA	Westphalia loamy fine sand, 0 to 2 percent slopes	49	IIs-6	2o1
WaB	Westphalia loamy fine sand, 2 to 5 percent slopes	49	IIs-6	2o1
WdA	Westphalia fine sandy loam, 0 to 2 percent slopes	49	I-5	2o1
WdB	Westphalia fine sandy loam, 2 to 5 percent slopes	49	IIe-5	2o1
WeB	Woodmansie sand, 0 to 5 percent slopes	50	IVs-8	4s1
WeC	Woodmansie sand, 5 to 10 percent slopes	50	IVs-8	4s1
WgB	Woodmansie sand, firm substratum, 2 to 5 percent slopes	50	IVs-8	4s1
WhB	Woodmansie sand, loamy substratum, 0 to 5 percent slopes	50	IVs-8	4s1
WkA	Woodstown loamy sand, 0 to 2 percent slopes	51	IIIw-15	2w1
WlA	Woodstown loamy sand, loamy substratum, 0 to 2 percent slopes	51	IIIw-15	2w1
WmA	Woodstown fine sandy loam, 0 to 2 percent slopes	51	IIw-14	2w1
WmB	Woodstown fine sandy loam, 2 to 5 percent slopes	52	IIw-14	2w1
WnA	Woodstown fine sandy loam, clayey substratum, 0 to 2 percent slopes	52	IIw-14	2w1
WnB	Woodstown fine sandy loam, clayey substratum, 2 to 5 percent slopes	52	IIw-14	2w1

face layer of this truncated soil is low in organic-matter content and contains more clay than the original surface layer. Runoff and erosion are moderate. Most of this soil is within the Fort Dix Military Reservation.

This soil normally is seeded with a mixture of perennial plants that provide food or cover for wildlife. These plants add organic matter to the soil. (Capability unit IIw–13; woodland suitability group 2w1)

Adelphia Fine Sandy Loam, Glauconitic Variants

These soils are moderately high in content of glauconite throughout the profile. Also, they have a subsoil slightly finer textured and nearer the surface than in the profile described as typical for the Adelphia series.

In a typical profile of a glauconitic variant, the surface layer is a very dark grayish-brown fine sandy loam about 10 inches thick. The subsoil is a light olive-brown heavy sandy clay loam that extends to a depth of about 28 inches and is mottled with olive gray in the lower part. The underlying material is dark-olive stratified sandy loam containing thin iron-cemented sheets. Although the surface layer and subsoil are moderately high in glauconite, the texture of these layers is more like that in corresponding layers of other Adelphia soils than like that in Kresson or Marlton soils.

Natural drainage of the glauconitic variants is similar to that of normal Adelphia soils, but permeability of the subsoil is slower. Also, the available water capacity is higher and natural fertility is slightly higher.

These soils are similar to normal Adelphia soils in natural vegetation and in use for farming.

Typical profile of Adelphia fine sandy loam, glauconitic variant, 0 to 2 percent slopes, 0.8 mile northwest of Tilghmans Corner:

Ap—0 to 10 inches, very dark grayish-brown (2.5Y 3/2) fine sandy loam; moderate, medium, granular structure; friable; glauconite content moderately high; abrupt, smooth boundary; horizon 8 to 12 inches thick.

B2—10 to 18 inches, light olive-brown (2.5Y 5/4) heavy sandy clay loam; weak, medium, subangular blocky structure; very friable when moist, slightly sticky and plastic when wet; sand grains bridged with clay; glauconite content moderately high; gradual, smooth boundary; horizon 6 to 12 inches thick.

B3—18 to 28 inches, light olive-brown (2.5Y 5/4) heavy sandy clay loam; common, medium, distinct mottles of olive gray (5Y 5/2); weak, medium, subangular blocky structure; very friable when moist, slightly sticky when wet; sand grains bridged; yellowish-red (5YR 4/6) iron concretions as much as one-half inch in diameter; glauconite content moderately high; gradual, smooth boundary; horizon 6 to 15 inches thick.

C—28 to 60 inches, dark-olive (5Y 3/3) sandy loam stratified with reddish-brown (5YR 4/3), iron-cemented layers 1 to 2 inches thick.

These soils have a darker A horizon than the normal Adelphia soils. They lack the A2 horizon that commonly occurs in the normal Adelphia soils. The B horizon is slightly finer textured than that in the profile described as typical for the Adelphia series. The glauconitic variants, however, are similar to the normal Adelphia soils in consistence and in color, or they are more olive.

The C horizon of the glauconitic variant is darker colored than that in normal Adelphia soils. The iron-cemented layers generally are between depths of 36 and 60 inches, but they are closer than 36 inches from the surface in sloping areas. The layers range from ½ inch to 6 inches or more in thickness and from firm to extremely firm in consistence. Because these layers are very slowly permeable, deep drainage is difficult to obtain.

The glauconitic variants are mostly associated with other Adelphia soils and with Collington, Marlton, Kresson, and Shrewsbury soils. Mottling in these variants distinguishes them from the Collington soils. The variants do not contain so much clay in the subsoil as do the Marlton and Kresson soils, and they are not so gray as the Shrewsbury soils.

Adelphia fine sandy loam, glauconitic variant, 0 to 2 percent slopes (AnA).—This soil has the profile described as typical for the Adelphia glauconitic variant. Included with this soil in mapping are small areas of other Adelphia soils and of Kresson, Marlton, and Collington soils.

This soil warms somewhat late in spring, and it dries slowly after heavy rains. Drainage needs are similar to those of Adelphia fine sandy loam, 0 to 2 percent slopes, and the same kinds of crops are grown. (Capability unit IIw–14; woodland suitability group 2w1)

Adelphia fine sandy loam, glauconitic variant, 2 to 5 percent slopes (AnB).—Runoff is more rapid on this soil than on Adelphia fine sandy loam, glauconitic variant, 0 to 2 percent slopes, and the hazard of erosion is greater. Interceptor underdrains may be effective in removing some of the excess water from this soil. (Capability unit IIw–14; woodland suitability group 2w1)

Alluvial Land

Alluvial land consists of areas where the soil materials are so variable that mapping units cannot be placed in a series. Instead, the areas are described as Alluvial land, loamy, and Alluvial land, sandy.

Alluvial land, loamy (Ao).—This land type consists of stream deposits adjacent to meandering perennial streams that are subject to stream overflow. Most areas flood annually or several times a year, but a small portion is high enough to escape the annual overflow. Along the main branches of the Rancocas Creek, where the streams have cut deeply, the floodwaters are confined by steep side slopes. But some streams, such as Barkers Creek, are not confined and overflow the nearby upland soils. The native vegetation is fast-growing hardwoods consisting of yellow-poplar, red oak, pin oak, white oak, willow oak, sweetgum, ash, red maple, beech, boxelder, elm, and river birch.

Soil textures vary considerably according to the position of this land and the source of material. Although the surface layer is sandy loam in most places, there are areas where the sand components are dominantly fine or where the texture may be as fine as clay loam. In some places the soil is underlain by olive-colored beds of sandy clay. Included with this land in mapping are small areas of Muck.

The soil material ranges from black to gray to olive to reddish brown. It is prominently mottled in some

places but is not mottled in others. Cemented iron is in forms ranging from small spherical concretions to 6-inch layers of ironstone. Although most areas have moderate to low glauconite content, glauconite is absent in some places and is in large amounts in other places. In most places the soil materials are extremely acid, but in some areas where the streams have cut through the Vincentown Formation into the underlying limy sand, the soil materials and water are nearly neutral.

Alluvial land, loamy, is moderately well drained to very poorly drained. Most of it is in low areas and is subject to frequent flooding. In these low areas, the water table is at the surface in winter and drops only about a foot in summer. Some areas are flooded only occasionally because they are several feet higher than the lowest areas. In these higher areas the water table is 2 or 3 feet from the surface in winter and drops about a foot in summer.

Some of these higher areas have been cleared for crops, though they are small and in places are surrounded by low areas. At Ewansville and Lumberton on the North and South Branches of the Rancocas Creek, numerous houses have been built on these higher areas, though they are subject to flooding. The last major damaging flood was in 1940. At Mount Holly, however, the channel has been widened, deepened, and straightened to provide some flood protection below Ironworks Park Dam. (Capability unit VIw–28; woodland suitability group 1w1)

Alluvial land, sandy (Ap).—This land consists mainly of thick deposits of loose, coarse sand and gravel adjacent to the larger meandering perennial streams in the outer Coastal Plain. Most of the land is subject to annual flooding, and about 5 to 10 percent of the area is subject to flooding every 5 to 10 years. Except for a dark surface layer, the soil material has few well-developed horizon features.

This land is nearly level to gently sloping. The soil material is black, dark brown, or very dark gray. In some places it is mucky to a depth of a foot or more. The underlying sand is grayish brown and contains a considerable amount of rounded quartzose pebbles in places. Because the streams are shallow in most places, floodwaters spread rapidly to the adjacent soils, where they deposit much debris.

Alluvial land, sandy, is mostly associated with Atsion and Berryland soils and with Muck, and they are included in mapped areas. Also included are sandy soils that do not have an organic subsoil.

This land has a constantly high water table that is controlled by the adjacent stream. This water table is at the surface in winter and, except during extreme drought, it drops only about a foot in summer. The soil material is rapidly permeable, low in fertility, and extremely acid. Where this land is drained, the available water capacity is low in the sandy areas but is high in the mucky areas. Frost heave is slight on the sand and severe in mucky areas.

The native vegetation varies. Atlantic white-cedar grows in the mucky areas, and pitch pine, red maple, blackgum, gray birch, and bay magnolia grow in the sandy areas.

Some of this land has been cleared and planted to cranberries or blueberries. Water is impounded in some areas. This land is suitable for dug ponds, but there is an overflow hazard. (Capability unit VIw–28; woodland suitability group 3w1)

Atsion Series

The Atsion series consists of poorly drained, dark-gray sandy soils that formed on the borders of swamp and the bottoms of some circular depressions in the outer Coastal Plain. These soils are also on extensive terraces adjacent to the Mullica, Batsto, and Wading Rivers. The terraces contain numerous narrow and intermittent streambeds. Since these soils are nearly level and in low positions, they receive runoff from the slopes above.

A typical profile has a dark-gray sand plow layer about 8 inches thick. The subsurface layer, about 10 inches thick, is light-gray sand. The subsoil extends to a depth of about 36 inches and is weakly to strongly cemented, very dark brown loamy sand in the upper 6 inches and very dark gray sand below. The substratum is brown loose sand.

Because of the high water table, Atsion soils warm late in spring. Where drained, they have a low available water capacity. When the water table is low enough to permit percolation, permeability is moderately rapid. These soils have moderate organic-matter content and low fertility. Added fertilizers leach readily. Since few areas have been limed, Atsion soils are very strongly acid in most places.

When rainfall is normal, Atsion soils are saturated 6 to 8 months of the year. The water table starts to rise in October, reaches its peak of about 1 foot from the surface, and drops to about 2 feet below the surface by the end of May. In some areas drained for blueberries, the water level is 3 feet below the surface in summer. In extremely dry summers, some drained areas have a water table below 5 feet.

Native vegetation on Atsion soils is a stand of pitch pine and scattered scrub oak trees and a dense understory of highbush blueberry, sheep laurel, sweet pepperbush, gallberry, and greenbrier.

Where they are drained, these soils are suited to highbush blueberries and cranberries. Blueberries are grown more extensively on Atsion soils than on any other kind of soil in Burlington County.

In the management of Atsion soils for blueberries, the water level in summer is controlled at about 2 feet below the surface by subsurface irrigation and the use of ditches. Also, the cropland is smoothed to prevent surface ponding and to prepare the fields for the heavy over-the-row harvesters.

Atsion soils are generally good sites for dug ponds, but recharge may be slow in some areas where the substratum is loamy.

Typical profile of Atsion sand in a blueberry field that is 2.8 miles south of Speedwell and adjacent to County Highway 563:

Ap—0 to 8 inches, dark-gray (10YR 4/1) sand, gray (10YR 5/1) when dry; single grain; loose; abrupt, wavy boundary; horizon 6 to 10 inches thick.

Where this soil is used for crops, it requires drainage by underdrains or ditches. Underdrains must be kept above the thick beds of clay. Erosion of ditchbanks can be reduced by sloping the banks, and seeding them to protective plants. (Capability unit IIIw–21; woodland suitability group 3w2)

Freehold Series

The Freehold series consists of well-drained, sandy and loamy soils that have a moderately high or high available water capacity. These soils, which generally formed in glauconitic marine deposits, contain small amounts of glauconite. Freehold soils are mostly nearly level or gently sloping, but they range to steep.

In a typical profile the suface layer is dark grayish-brown fine sandy loam about 11 inches thick. The subsurface layer is light olive-brown fine sandy loam about 4 inches thick. A dark yellowish-brown subsoil extends to a depth of about 35 inches. It is fine sandy loam in the upper part, sandy clay loam in the middle, and fine sandy loam in the lower part. The underlying material extends to a depth of at least 60 inches and is stratified light olive-brown loam and olive-brown fine sandy loam.

Freehold soils are moderately or moderately slowly permeable. Except for a day or two after extremely heavy rains, these soils do not contain free water within 60 inches of the surface. High-value crops are irrigated. Fertility is moderate or moderately high. Added fertilizers do not leach readily, and response to them is good. Freehold soils warm moderately early in spring and are easily worked. Organic-matter content ranges from moderate in the fine sandy loams to low in the loamy sands. Except where they have been heavily limed, Freehold soils are very strongly acid.

The native vegetation is a fast-growing forest of red oak, white oak, scarlet oak, yellow-poplar, beech, and hickory. Freehold soils are well suited to crops and are the most extensively farmed soils in the county. Nearly all areas of gently sloping soils have been cleared for farming. These soils are well suited to fruit, vegetables, grain, hay, pasture, nursery plants, and cultivated sod.

Typical profile of Freehold fine sandy loam, 0 to 2 percent slopes, in a cultivated peach orchard west of Cropwell Road south of State Route 73:

Ap—0 to 11 inches, dark grayish-brown (2.5Y 4/2) fine sandy loam; weak, fine, granular structure; friable; glauconite content low; abrupt, smooth boundary; horizon 10 to 12 inches thick.

A2—11 to 15 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, medium, subangular blocky structure that has platy tendencies; very friable; glauconite content low; abrupt, smooth boundary; horizon 4 to 10 inches thick.

B1—15 to 22 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; moderate, medium, subangular blocky structure; friable, slightly sticky and slightly plastic when wet; glauconite content low; gradual, wavy boundary; horizon 0 to 8 inches thick.

B2t—22 to 30 inches, dark yellowish-brown (10YR 4/4) sandy clay loam; moderate, medium, subangular blocky structure; friable, slightly sticky and plastic when wet; sand grains bridged; glauconite content low; gradual, wavy boundary; horizon 6 to 18 inches thick.

B3—30 to 35 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium, subangular blocky structure; very friable; glauconite content low; abrupt, smooth boundary; horizon 0 to 12 inches thick.

C—35 to 60 inches, alternating layers of light olive-brown (2.5Y 5/4) loamy sand and olive-brown (2.5Y 4/4) fine sandy loam; loamy sand layers are single grain, loose; sandy loam layers are massive, friable or slightly firm; glauconite content low; mass speckled by unweathered dark glauconite grains.

In places Freehold soils have small amounts of rounded quartzose gravel. The glauconite content of the subsoil ranges from 1 to 10 percent. In places where there is a sandy deposit on the surface, glauconite is absent or is so weathered that it cannot be recognized.

The solum ranges from 30 to 40 inches in thickness. Where the underlying material is different from the normal stratified sandy beds, the soil is mapped separately.

In areas that have not been plowed, there are a nearly black A1 horizon, 2 to 4 inches thick, and a lower bleached gray horizon, 2 to 4 inches thick. Both horizons are destroyed when the soil is plowed.

The Ap horizon ranges from 2.5Y to 10YR in hue, is 4 or 5 in value, and ranges from 2 to 4 in chroma. The A2 horizon ranges from 2.5Y to 7.5YR in hue and is 4 or 5 in value.

The B horizon ranges from 10YR to 5YR in hue, is 4 or 5 in value, and ranges from 4 to 6 in chroma. In high positions, where oxidation takes place freely, the color of the B horizon is redder than normal. This is especially true in North Hanover Township at elevations above 150 feet, where iron concretions are numerous. The B horizon contains about 10 percent more clay than the A horizon.

The C horizon generally contains less clay and appreciably less silt than the B horizon. In places the C horizon is clayey.

Freehold soils are associated mostly with Holmdel, Collington, Sassafras, Westphalia, Keyport, and Marlton soils. Freehold soils lack the mottling common in the Holmdel soils. They contain less glauconite than the Collington and Marlton soils and more glauconite than the Sassafras and Westphalia soils. The content of clay is not so high in Freehold soils as it is in the Keyport and Marlton soils. Freehold soils lack the olive colors that occur in Marlton soils.

Freehold fine sandy loam, 0 to 2 percent slopes (FfA).—This soil has the profile described as typical for the series. Included with this soil in mapping are small areas of Collington, Sassafras, Holmdel, and Keyport soils. Drains may be needed on Holmdel and Keyport soils. Also included and indicated on the map by a circled X are about 200 acres of Freehold fine sandy loam from which the subsoil was removed for use as molding sand. After the subsoil was removed, the topsoil was replaced and the area was farmed again. The soils in these areas have a considerably lower available water capacity than undisturbed Freehold fine sandy loam, 0 to 2 percent slopes, and they need irrigation much sooner.

This soil is suited to nearly all crops grown in the area. Limitations to management are few. (Capability unit I–5; woodland suitability group 1o1)

Freehold fine sandy loam, 2 to 5 percent slopes (FfB).—The use of this soil is limited by runoff and susceptibility to erosion. The hazard of erosion can be reduced by contour farming, stripcropping, and the use of cover crops. The profile of this soil is similar to that described as typical for the series. (Capability unit IIe–5; woodland suitability group 1o1)

hot spells some crops are scalded by heat reflected from the sand.

Galestown soils are subject to soil blowing that sandblasts crops. These soils are low in organic-matter content and fertility. Added fertilizers leach readily. Unless lime is added at frequent intervals, these soils are very strongly acid.

The native vegetation is a forest consisting mostly of mixed oaks, hickory, and scattered Virginia pines. Virginia pines have seeded naturally in areas left idle, but now they grow in only a few places. Sassafras and wild cherry are common in idle areas.

These soils were formerly used for general crops, but when irrigation was introduced, farmers gradually switched to high-value vegetables. Nearly all areas are now irrigated, and the common crops are sweet corn, peaches, snap beans, and cantaloupes. On some fields two crops are grown in a year.

Because the population is concentrated along the Delaware River, a large acreage of these soils has been taken for residential, commercial, and industrial development.

Typical profile of Galestown sand, 0 to 5 percent slopes, in a cultivated field south of the National Cemetery at Beverly:

Ap—0 to 10 inches, very dark grayish-brown (10YR 3/2) sand; very weak, fine, granular structure; very friable; abrupt, smooth boundary; horizon 8 to 12 inches thick.

A2—10 to 23 inches, yellowish-brown (10YR 5/4) sand; single grain; loose; clear, smooth boundary; horizon 10 to 18 inches thick.

B2t—23 to 30 inches, strong-brown (7.5YR 4/6) loamy sand; very weak subangular blocky structure; very friable; sand grains weakly bridged; gradual, smooth boundary; horizon 7 to 13 inches thick.

B3—30 to 38 inches, strong-brown (7.5YR 4/6) loamy sand; very weak subangular blocky structure; very friable; gradual, smooth boundary; horizon 4 to 8 inches thick.

C—38 to 60 inches, dark yellowish-brown (10YR 4/6) sand containing thin layers of strong-brown (7.5YR 4/6) loamy sand; sand is single grain and loose; loamy sand is massive and friable.

Galestown soils contain varying amounts of rounded quartzose pebbles. Although in most places the amounts are small, some areas within a mile of the Delaware River have thick beds of pebbles and cobblestones 3 to 5 feet below the surface. Because of the community development in most of these areas, they have not been mapped separately.

These soils are mostly fine sand and medium sand throughout the solum, and the texture in the C horizon is about the same.

The A1 horizon is very dark and about 4 inches thick. Plowing mixes this horizon with part of the yellowish-brown A2 horizon, and an Ap horizon is formed. The Ap horizon is 3 or 4 in value and 2 or 3 in chroma. The surface layer is sand, consisting of mostly fine sand, but not enough to make a fine sand texture. The A2 horizon is 7.5YR or 10YR in hue. Thickness of the A horizon averages about 23 inches but ranges from 18 to 27 inches.

The B horizon generally is 7.5YR in hue, but it is 10YR in places. The B2t horizon is loamy sand or sand, though it normally contains 3 to 6 percent more clay than the A horizon.

In places the C horizon has clayey layers or gravel beds. In other areas it consists of material much like that of the A and B horizons, though it has slightly less clay and silt or has thin bands of clay and silt in the upper part.

Galestown soils are associated with Klej and Sassafras soils. They lack the mottling that is common in the Klej soils, and they have less clay and silt in the subsoil than the Sassafras soils. Galestown soils have a thicker surface layer than Downer soils, and a coarser textured subsoil.

Figure 11.—Sandblasting of vegetable crops can be reduced by protecting them with narrow strips of close-growing crops. The soil is Galestown sand, 0 to 5 percent slopes.

Galestown sand, 0 to 5 percent slopes (GaA).—This soil has the profile described as typical for the series. Included with this soil in mapping are small areas of Klej and Sassafras soils and also small areas of Galestown sand, clayey substratum.

This soil is well suited to irrigated sweet corn, peaches, snap beans, and cantaloupes. The effect of soil blowing can be reduced by the use of windbreaks or cover crops, or by planting narrow strips of close-growing crops (fig. 11). Soluble fertilizers applied as needed compensate for losses though leaching. (Capability unit IVs–7; woodland suitability group 3s1)

Galestown sand, clayey substratum, 0 to 5 percent slopes (GcB).—The clayey substratum of this soil generally is at a depth of 40 to 60 inches, but in places it is only 30 inches from the surface. Otherwise the profile of this soil is similar to that described as typical for the series. Drainage is needed where the clayey substratum is near the surface. Except for drainage, farm use and management are the same as on Galestown sand, 0 to 5 percent slopes. (Capability unit IVs–7; woodland suitability group 3s1)

Holmdel Series

The Holmdel series consists of moderately well drained or somewhat poorly drained loamy and sandy soils. These soils contain small amounts of glauconite, for they generally formed on marine deposits that contain this mineral. They have a moderately high seasonal water table.

In a typical profile the surface layer is dark grayish-brown fine sandy loam about 10 inches thick. The subsoil, about 24 inches thick, is dark-brown mottled sandy clay loam. The underlying material is stratified

dark yellowish-brown and olive-brown loamy sand and sandy loam.

Holmdel soils are moderate or moderately slow in permeability, and they have a moderately high or high available water capacity. Fertility is moderate or moderately high. Where these soils have not been drained, the water table fluctuates. When rainfall is normal, the water table starts to rise in October, reaches its peak late in winter or early in spring, and drops to a depth of more than 5 feet by June. The water table is held up by material that, except in soils having a clayey substratum, generally is at a depth of more than 5 feet. Holmdel soils receive both surface runoff and lateral seepage of ground water from higher soils.

The native vegetation is a forest consisting mostly of red oak, white oak, scarlet oak, yellow-poplar, beech, and hickory. In somewhat poorly drained areas, however, pin oak, willow oak, sweetgum, and southern red oak are dominant. Common shrubs are viburnum and spicebush.

Most areas have been cleared for crops. Grown in adequately drained areas are corn, soybeans, small grains, hay, pasture, fruit, vegetables, and nursery plants.

In most places, farmed Holmdel soils have been drained by open ditches or underdrains. Although drained areas may be saturated in extremely wet periods, these soils drain readily. Added fertilizers do not leach readily, and response to them is good. Except where they have been limed heavily, these soils are very strongly acid.

Typical profile of Holmdel fine sandy loam, 0 to 2 percent slopes, in a cultivated field 1 mile west of Ellisdale:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine granular structure; friable; glauconitic content low; abrupt, smooth boundary; horizon 8 to 12 inches thick.

A2—10 to 14 inches, yellowish-brown (10YR 5/4) fine sandy loam; very weak, medium, subangular blocky structure; very friable; glauconite content low; abrupt, smooth boundary; horizon 0 to 10 inches thick.

B1—14 to 21 inches, dark-brown (7.5YR 4/4) light sandy clay loam; moderate, medium, subangular blocky structure; friable or firm when moist, slightly sticky and plastic when wet, hard when dry; sand grains coated with clay films; glauconite content low; gradual, smooth boundary; horizon 6 to 18 inches thick.

B2t—21 to 34 inches, dark-brown (7.5YR 4/4) sandy clay loam; few, large, distinct mottles of olive gray (5Y 5/2); moderate, medium, subangular blocky structure that has weak platy tendencies; friable when moist, slightly sticky when wet; sand grains coated with clay; glauconite content low; mica common; gradual, smooth boundary; horizon 10 to 20 inches thick.

C—34 to 60 inches, alternating layers of dark yellowish-brown (10YR 4/4) and olive-brown (2.5Y 4/4) loamy sand and sandy loam; loamy sand is single grain and loose; sandy loam is massive and friable, slightly sticky and plastic when wet; content of unweathered glauconite low.

Holmdel soils contain various amounts of rounded quartzose pebbles, but not in abundance in most places. In most places the solum is between 30 and 40 inches thick.

Unplowed soils have a dark A1 horizon about 4 inches thick and a bleached gray A2 horizon about 2 to 4 inches thick. Plowing destroys these two horizons and mixes them with a yellowish-brown A2 horizon that normally extends to a depth of about 14 inches to form the Ap horizon. The Ap horizon ranges from 2.5Y to 10YR in hue.

The B horizon ranges from 2.5Y to 7.5YR in hue and is 4 or 5 in value. Where these soils are moderately well drained, the chroma ranges from 4 to 8. Where these soils are somewhat poorly drained, the B horizon ranges from 2 to 4 in chroma.

The C horizon is clayey in places, and it contains thin sheets of iron oxide in places.

Holmdel soils occur mostly below Freehold soils and above Shrewsbury soils. They can be distinguished by mottling, which is lacking in the Freehold soils, and they are not so gray as the Shrewsbury soils. Holmdel soils are similar to Woodstown soils, except that they contain glauconite and the Woodstown soils do not. Holmdel soils lack the thick, sandy A horizon common to Pemberton soils.

Holmdel fine sandy loam, 0 to 2 percent slopes (HdA).—This soil has the profile described as typical for the series. Included with this soil in mapping are some areas of loamy sandy soils and some Donlonton, Adelphia, and Shrewsbury soils.

Where adequately drained, this soil is suited to general crops, fruits, and vegetables. It needs drainage by either underdrains or open ditches. Even where drained, it may become wet when rainfall is abnormally high. If high-value crops are grown, surface drains, as well as underdrains, may be needed. Ditchbanks should be sloped and seeded to reduce silting. (Capability unit IIw–14; woodland suitability group 2w1)

Holmdel fine sandy loam, 2 to 5 percent slopes (HdB).—This soil has a profile similar to that described as typical for the series. Drainage is the main limitation to use of this soil, but there also is a hazard of erosion.

This soil can be drained by underdrains or by open ditches. In many places interceptor underdrains are efficient in lowering the water table. Ditchbanks should be sloped and seeded to reduce silting.

Erosion can be controlled by stripcropping, using cover crops, or terracing. (Capability unit IIw–14; woodland suitability group 2w1)

Holmdel loamy sand, 0 to 5 percent slopes (HlB).—This soil has a surface layer about 18 inches thick that consists of loose loamy sand, but otherwise its profile is similar to that described as typical for the series. This soil is subject to soil blowing. It warms early in spring and is easily worked. It is only moderately fertile, and it needs more frequent irrigation than the Holmdel fine sandy loams.

Included with this soil in mapping are areas of Freehold and Shrewsbury soils. The Freehold soils are in high positions, and the Shrewsbury soils are in low positions.

This Holmdel soil has a fluctuating water table and needs drainage if it is to be farmed. Deep drainage is effective in lowering the water table. Soil blowing needs to be controlled on extensive exposed areas of this soil.

Where it is adequately drained, this soil is suited to early vegetables and fruit and is somewhat less suited to general farm crops. (Capability unit IIIw–15; woodland suitability group 2w1)

Holmdel fine sandy loam, clayey substratum, 0 to 2

clay, underdrains should be laid above the substratum. Recharge of ground water is slow in dug ponds. (Capability unit IIIw–16; woodland suitability group 3s1)

Klej fine sand, 0 to 2 percent slopes (KoA).—Except that this soil has a higher percentage of fine sand, at least to a depth of 30 to 40 inches, its profile is similar to that described as typical for the series. These fine sands are unstable. If excavations are made in them, they flow more readily than the medium and coarse sands. The available water capacity and fertility are slightly higher in this soil than in Klej sand, 0 to 4 percent slopes. In addition, this soil has a weakly developed subsoil that has 3 to 5 percent more clay than the surface layer. This additional clay slows leaching of fertilizers somewhat.

Included with this soil in mapping are small areas of Galestown sand and Evesboro fine sand.

Widely spaced open ditches or underdrains keep the water table down where it does not interfere with farming. Maintenance of ditchbanks is more costly than on Klej sand, 0 to 4 percent slopes, and the soil is more subject to soil blowing. (Capability unit IIIw–16; woodland suitability group 3s1)

Kresson Series

The Kresson series consists of somewhat poorly drained soils that contain large amounts of glauconite because they formed in marine deposits containing large amounts of glauconite.

In a typical profile the surface layer is about 8 inches thick and consists of olive-gray fine sandy loam mottled with yellowish brown. The subsoil extends to a depth of 36 inches and is dark olive gray mottled with dark yellowish brown. It is sandy clay in the upper 12 inches and sandy clay loam below. The substratum is stratified olive-gray and dark yellowish-brown sandy loam and sandy clay loam.

The permeability is slow in the subsoil and moderately slow in the surface layer and substratum when the soil is moist and the clays are swelled. Permeability is more rapid in summer when the clay contracts and the soil cracks. The available water capacity is high. Although excess water is perched over the sandy clay subsoil for some time after heavy rains, the soils do not become completely saturated. When rainfall is normal, undrained Kresson soils have ground water in the substratum from October to May, and excess water may be perched over the subsoil in the same period.

These soils are high in natural fertility, and added fertilizers do not leach readily. Kresson soils are generally very strongly acid, and large additions of lime are needed to correct this condition. In places, the substratum is only slightly acid or nearly neutral. Organic-matter content is low in the loamy sand and is moderate in the loam and fine sandy loam.

The native vegetation is a hardwood forest consisting of mostly oak, hickory, beech, ash, redcedar, and Virginia pine. Virginia pine or redcedar normally seed in idle areas.

Kresson soils are well suited to general crops. The loamy sand is used mostly for vegetables, corn, soybeans, small grains, hay, and pasture. The loamy sand warms early and is easily worked, but it is subject to soil blowing. The Kresson fine sandy loam and loam soils are difficult to work, because the period of optimum moisture is so short. They are either too wet or too dry most of the time.

Only a very small acreage of the Kresson soils is irrigated. When rainfall is normal, deep drainage and surface drainage are needed. The ground water can be lowered by use of open ditches or underdrains. Because of the clayey subsoil, underdrains alone cannot drain off the surface waters fast enough. These soils are only moderately suitable for dug ponds.

Typical profile of Kresson fine sandy loam, 0 to 3 percent slopes, in a cultivated field one-eighth mile north of Evesboro:

Ap—0 to 8 inches, olive-gray (5Y 4/2) fine sandy loam; few, fine, prominent mottles of yellowish brown (10YR 5/8); moderate, medium, granular structure; friable, sticky and plastic when wet; glauconite content medium to high; 3 to 5 percent rounded quartzose pebbles as much as 2 inches in diameter; abrupt, smooth boundary; horizon 6 to 12 inches thick.

B21t—8 to 20 inches, dark olive-gray (5Y 3/2) sandy clay, dark olive (5Y 3/3) when crushed; many, fine, distinct mottles of dark yellowish brown (10YR 4/4); moderate to strong, coarse, angular blocky structure; very firm when moist, very hard when dry, very sticky and plastic when wet; distinct clay films on ped faces; glauconite content more than 40 percent; gradual, smooth boundary; horizon 10 to 24 inches thick.

B22t—20 to 36 inches, dark olive-gray (5Y 3/2) sandy clay loam, dark olive (5Y 3/3) when crushed; many, fine to medium, distinct mottles of dark yellowish brown (10YR 4/4); moderate, coarse and medium, subangular blocky structure; firm to friable when moist, hard when dry, sticky and plastic when wet; discontinuous thin clay films on ped faces; glauconite content high; abrupt, smooth boundary; horizon 10 to 20 inches thick.

C—36 to 60 inches, alternating layers of olive gray (5Y 4/2) and dark yellowish brown (10YR 4/4) sandy loam and sandy clay loam; many, medium, prominent mottles; massive; friable when moist, sticky and plastic when wet; unweathered glauconite content high; glauconite adds dark grains to mass color; lower brown layer is commonly iron cemented.

Kresson soils contain varying, but generally not large, amounts of quartzose gravel.

Unplowed Kresson soils have a very dark A1 horizon about 4 inches thick. When they are plowed, this horizon is mixed with the horizon below to form the Ap horizon. Kresson soils tend to have a darker Ap horizon than other soils of the county that have the same natural drainage. The Ap horizon is 5Y or 2.5Y in hue and 3 or 4 in value. Textures are loam, fine sandy loam, and loamy sand.

The B horizon is mostly 5Y in hue, but in places it is 2.5Y. It is 3 or 4 in value and ranges from 2 to more than 4 in chroma. Mottles are generally prominent. They are 10YR or 5YR in hue, 4 or 5 in value, and range from 4 to 8 in chroma. Mottles range from common to many and are generally fine or medium. In most places the B horizon is mainly sandy clay, but commonly it is sandy clay loam in some part. Structure is generally blocky or angular blocky, but it tends to be prismatic.

Most strata of the C horizon are friable and appear porous. All are highly glauconitic, and when they become wet, the clays swell and are slowly permeable. In many places iron sheets prevent normal movement of water downward.

Kresson soils are associated mainly with Marlton, Colemantown, and Adelphia soils. They are more gray than

Marlton soils and have mottling closer to the surface. Kresson soils are not so gray as Colemantown soils and are not so sandy or so brown as Adelphia soils.

Kresson loamy sand, 0 to 3 percent slopes (KwA).—This soil is not extensive. It occurs north of Medford and north of Cookstown along the Burlington-Ocean County line. The loamy sand surface layer averages about 16 inches in thickness and apparently is a wind deposit. Included with this soil in mapping are small areas of Marlton soils.

This soil warms earlier in spring than Kresson fine sandy loam and Kresson loam, and it is better suited to vegetables.

Water is absorbed readily by the loamy sand surface layer, but it is not transmitted readily through the sandy clay subsoil. As a consequence, the water is perched over the subsoil for long periods and surface drainage is needed. Also needed is protection from soil blowing by the use of windbreaks, cover crops, or windstripping. (Capability unit IIIw–12; woodland suitability group 2w1)

Kresson fine sandy loam, 0 to 3 percent slopes (KxA).—Most of this soil is nearly level and receives runoff from the slopes above. It has the profile described as typical for the series. Included with this soil in mapping are small areas of Kresson loam, and small areas of Marlton, Colemantown, and Adelphia soils, especially the glauconitic variant.

This Kresson soil is well suited to general crops and tomatoes. It drains slowly and warms late. Surface drainage is needed on this soil, and subsurface drainage may be needed in places. (Capability unit IIIw–12; woodland suitability group 2w1)

Kresson loam, 0 to 3 percent slopes (KyA).—This soil is hard to work because it is too wet or too dry much of the time. It is slower to warm in spring and more difficult to work than Kresson loamy sand and Kresson fine sandy loam. It is also less well suited to vegetables. This soil has a loam surface layer, but otherwise its profile is similar to that described as typical for the series. Included with this soil in mapping are small areas of clay loam.

This Kresson loam is well suited to hay, pasture, small grains, corn, and soybeans, though cultivation should be limited. Surface drainage is needed, and subsurface drainage is also needed in some places. (Capability unit IIIw–11; woodland suitability group 2w1)

Lakehurst Series

The Lakehurst series consists of deep, loose, moderately well or somewhat poorly drained sandy soils that have a bleached horizon 7 or more inches thick. Slopes range from 0 to 5 percent. These soils formed in coarse water-laid deposits on the outer Coastal Plain. They are the most extensive soils of Burlington County.

In a typical profile the surface layer is gray sand about 3 inches thick. The subsurface layer is light-gray sand about 12 inches thick. The subsoil, about 25 inches thick, is dark-brown loamy sand in the upper 3 inches and yellowish-brown sand mottled with grayish brown below. The substratum is pale-brown sand.

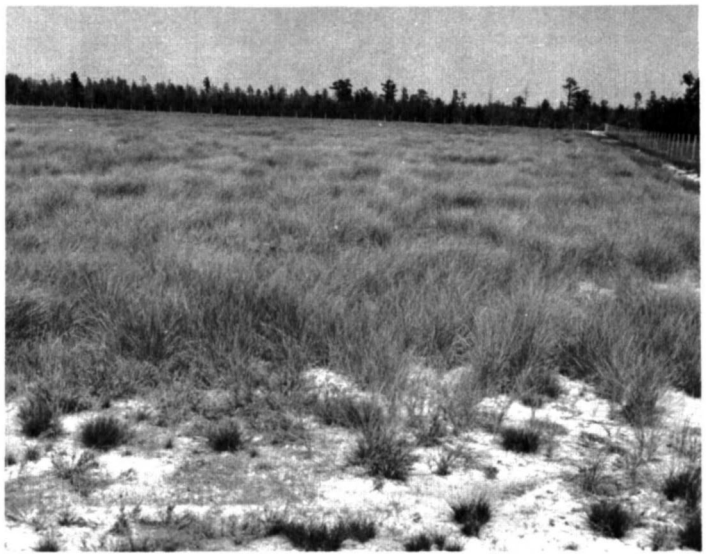


Figure 13.—**A special crop of beachgrass produced on Lakehurst soil for replanting on the coastal beaches.**

Lakehurst soils are very strongly acid and very low in natural fertility. Added fertilizers leach readily. The content of organic matter is very low. Because these soils are loose, they are subject to soil blowing and, on slopes, to water erosion. The fluctuating water table in these soils starts to rise in about October, rises to about 2 feet from the surface by late in winter or early in spring, and drops shortly after spring. Since plants use more water in summer than in other seasons, this water table is of value only to deep-rooted plants. Lakehurst soils have rapid or moderately rapid permeability and a low or very low available water capacity. They can be readily drained by widely spaced ditches or underdrains.

The natural vegetation is mostly pitch pine mixed with black and white oak, blackgum, and hickory trees. The understory includes lowbush blueberries, gallberries, and scattered sheep laurel. The sheep laurel generally has roots deep enough to reach the water table (*8*). Where wildfires have been severe, there are few hardwoods except scrub oak and blackjack oak. Where wildfires have been extremely severe, the trees are dwarfed to a height of about 4 to 6 feet regardless of age (*2*).

A considerable acreage of Lakehurst soils was cleared and cultivated about a hundred years ago, but little of this is now cultivated (fig. 13). Some areas recently have been cleared for planting to blueberries, but these soils are too low in fertility and too dry for this crop.

Where wildfires can be eliminated, trees can be grown for pulpwood on Lakehurst soils. Deer eat a large amount of acorns from scrub oak, and the Fish and Game Commission has cleared some areas and planted them to vegetation that supplies food for deer.

Typical profile of Lakehurst sand, 0 to 3 percent slopes, in a wooded area at Scout Camp Lenape near Medford:

383-859 O - 71 - 3

and sands occupy most of the area between the fine material and the boulders, cobblestones, and pebbles. The deposits are 5 to 20 feet thick along the Delaware River and 3 to 8 feet thick along the Bass River.

In the Palmyra area, Made land is very sandy and extremely low in fertility. After the dredged material was deposited, the area remained bare for a long time. It was subject to severe soil blowing until it was limed, fertilized, seeded, and tied down with stakes and twine. It was seeded with tall fescue, which provided an excellent cover.

On Hawk Island at Riverside, the dredged material contains large amounts of mica, probably from the Wissahickon schist at the bottom of the river. The material includes enough fines to make revegetation possible. Many perennial weeds, river birch, sycamore, black locust, red maple, boxelder, and willow invade readily. In this area, the material is being dredged again as a source of sand and gravel.

South of New Gretna, adjacent to the Bass River, are several areas of gravel, sand, silt, and clay. These areas are mostly sand, but they contain more silts than the Made land along the Delaware River.

This Made land is rapidly permeable and subject to severe soil blowing. Runoff is low and fertility is very low. Perennial grasses can be seeded to reduce soil blowing. Made land, dredged coarse material, is used primarily as a receiving area for dredging operations needed to keep the river channels open. In some areas the material is used as fill or as a source of gravel and sand. Some areas are used as sites for sanitary land fills.

Made land, dredged coarse material, is not suited to crops. Because of the high population along the Delaware River, it is not used for wildlife habitats. Some sites have been developed for industry; others have a potential for port and marine development. (Capability and woodland suitability unclassified)

Made land, dredged fine material (Mf).—This land type consists mostly of fine material dredged from the Delaware River and pumped into diked areas. The source of this material is mostly the thick clay beds of the Magothy Formation. Deposits are 10 to 20 feet thick. Thin sandy layers are mixed with the clay in places. Boulders, cobbles, pebbles, and sand generally are in the discharge area. The pumped silts and clays normally are held in suspension for some time before they settle, but where clay beds are dredged from the river bottom, the clay also comes out of the pipe as partly rounded masses 2 to 10 inches in diameter (fig. 17). In summer the clay cracks severely as it dries. Permeability is slow; runoff is high.

This land is not suitable for crops. It is used primarily for industrial development. Where large areas such as parking lots are to be paved, a permeable subbase is needed. (Capability and woodland suitability unclassified)

Made land, sanitary fill (Mg).—This land type consists of areas used for rubbish disposal and then covered by soil. Normally a series of trenches are dug, and rubbish, including garbage, metal, glass, wood, building foundation materials, industrial wastes, and many other materials, is dumped into them. As the trenches are filled, the refuse is covered by the excavated soil. Land fills are subject to uneven settling and the formation of hydrogen sulfide as the organic material decays. Some fill areas are formed by filling low wetlands.

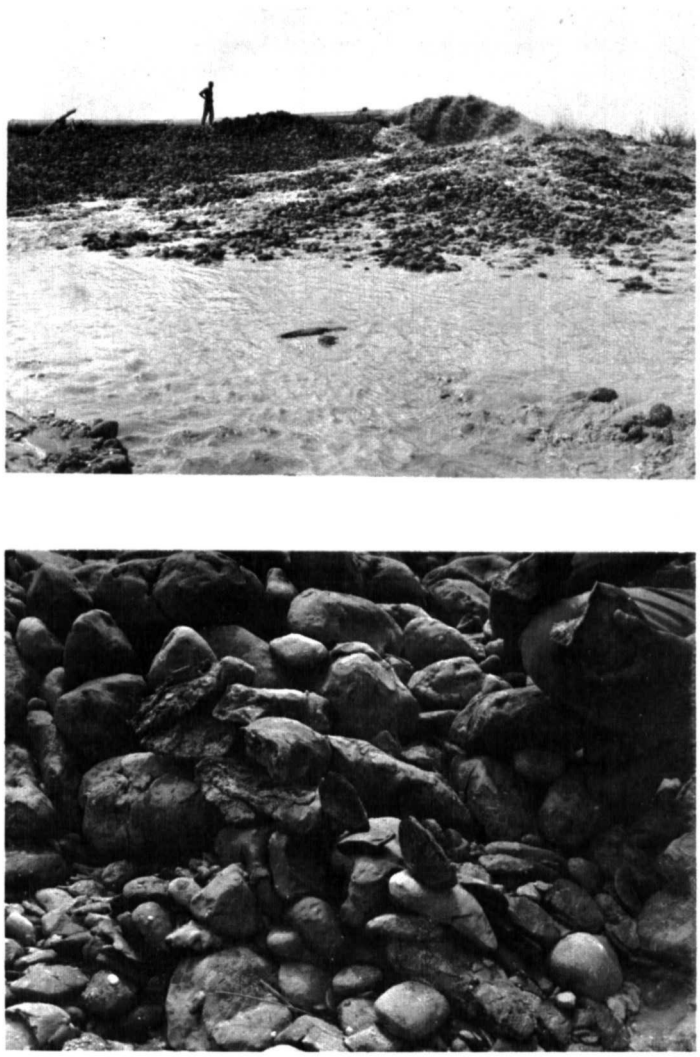


Figure 17.—Top, **dredge discharge area and cone of partly rounded clay masses;** ***bottom,*** **partly rounded clay masses at the discharge area.**

Some sanitary land fills are designed to be used again for land fills after allowing time for decomposition of the rubbish. Some areas have been converted to parks. Limitations are severe for use of the areas for crops, woodland, septic tank disposal fields, or building sites. Limitations are moderate for use of the area for wildlife habitats. (Capability and woodland suitability unclassified)

Marlton Series

The Marlton series consists of nearly level to sloping, moderately well drained and well drained soils that contain large amounts of glauconite. These soils occur in high positions. They formed in marine depos-

its that contain large amounts of glauconite.

In a typical profile the surface layer is dark olive-gray fine sandy loam about 10 inches thick. The subsoil extends to a depth of about 40 inches. It is dark-olive sandy clay in the upper 20 inches and olive-brown and dark olive-gray clay loam below. The underlying material is stratified dark olive-gray and olive-brown sandy loam and sandy clay loam.

When these soils are moist and the clays are swelled, permeability is moderately slow in the surface layer, slow in the subsoil, and moderately slow in the substratum. Permeability is more rapid in summer when the soils crack from shrinking. These soils have a high available water capacity. They never become completely saturated. Excess water is perched over the sandy clay subsoil for some time after heavy rains. Shrink-well properties are moderate. These soils are moderate in organic-matter content and high in fertility.

Drainage of these Marlton soils generally is not practical. Because they warm late in spring and dry slowly after rains, these soils are not easily worked. They are sometimes called "Sunday" soils—too wet to work on Saturday and too dry on Monday. The period of optimum moisture content for plowing and cultivating is short. These soils tend to be sticky when wet and very firm when dry. Because Marlton soils are very strongly acid, they need large additions of lime. At depths of 5 to 10 feet, the highly glauconitic material may not be acid.

The native vegetation is a hardwood forest consisting of mostly red oak, white oak, willow oak, hickory, yellow-poplar, ash, beech, redcedar, and Virginia pine. Fields left idle soon contain scattered redcedar.

These soils are mostly cleared for crops. but only a small acreage is irrigated. They are mostly used for dairy farming or for growing grain. The most common crops are corn, soybeans, small grains, hay, and pasture, though tomatoes and pumpkins are also grown in places.

Typical profile of Marlton fine sandy loam, 0 to 2 percent slopes, in a field about 2½ miles northwest of Medford:

Ap—0 to 10 inches, dark olive-gray (5Y 3/2) fine sandy loam; moderate, fine, granular structure; friable; more than 40 percent is glauconite; abrupt, smooth boundary; horizon 6 to 12 inches thick.

B2t—10 to 30 inches, dark-olive (5Y 3/3) sandy clay; strong, coarse, angular blocky structure that tends to be prismatic; very firm when moist, very hard when dry, sticky and very plastic when wet; distinct continuous clay films on ped faces; glauconite content high; gradual, smooth boundary; horizon 15 to 30 inches thick.

B3–30 to 40 inches, olive-brown (2.5Y 4/4) and dark olive-gray (5Y 3/2) clay loam; grains of the two colors about equal; moderate, medium and coarse, subangular blocky structure; friable when moist, hard when dry, slightly sticky and plastic when wet; discontinuous clay films on ped faces; glauconite content high; gradual, smooth boundary; horizon 5 to 18 inches thick.

C—40 to 60 inches, dark olive-gray (5Y 3/2) and olive-brown (2.5Y 4/4) sandy loam and sandy clay loam, individual grains in about equal amounts in alternating layers; massive; friable when moist, sticky when wet; 60 to 90 percent is unweathered glauconite; some underlying reddish-brown layers firmly cemented with iron.

Marlton soils contain varying amounts of rounded quartzose pebbles, but they normally are not abundant.

The A horizon is thinner and darker than that in most moderately well drained soils. The darker color is caused by the high glauconite content. The A horizon is 2.5Y or 5Y in hue, 3 or 4 in value, and ranges from 2 to 4 in chroma.

The B horizon ranges from 24 to 48 inches in thickness, but average thickness is about 30 inches. The B horizon is mainly 5Y in hue, but individual grains in the lower part of the horizon are 2.5Y in hue. The B horizon is 3 to 4 in value and ranges from 2 to more than 4 in chroma. In places mottles occur, mostly at a depth of more than 24 inches. These mottles normally are 10YR, 7.5YR, or 5YR in hue, and they are about 4 in value and chroma. In places the B horizon is heavy sandy clay loam in texture.

The C horizon swells when wet and is slowly permeable. It feels sandy, but acts more like clayey soil. In places, thin sheets of iron oxide slow the rate of percolation and cause lateral movement of water.

Marlton soils generally are associated with Kresson, Collington, and Adelphia soils. They lack the mottling in the upper 20 inches that is common in Kresson soils. Marlton soils contain more glauconite than Collington and Adelphia soils and are darker olive.

Marlton fine sandy loam, 0 to 2 percent slopes (MhA).—In high positions this soil generally is nearly well drained and contains excess water only after heavy rains. Areas in low positions require drainage. The profile of this soil is that described as typical for the series. Included with this soil in mapping are areas of Kresson soils and of the glauconitic variant of Adelphia soils.

This soil is well suited to general crops that do not need much cultivation. In some areas, the concentration of surface water can be reduced by stripcropping and terracing. (Capability unit IIs–2; woodland suitability group 2o1)

Marlton fine sandy loam, 2 to 5 percent slopes (MhB).—This soil has moderate runoff, and erosion is a hazard. It has a profile similar to that described as typical for the series. Included with this soil in mapping are eroded areas where plowing exposes the dark-olive sandy clay subsoil. Also included are areas of Collington and Adelphia soils that are sandier than this Marlton fine sandy loam and easier to work.

This soil is well suited to general crops. Stripcropping and terracing have been used to reduce runoff and erosion. (Capability unit IIe–2; woodland suitability group 2o1)

Marlton soils, 5 to 10 percent slopes (MrC).—Although the surface layer of these soils ranges from loamy sand to sandy clay, fine sandy loam is dominant. The sandy clay occurs in severely eroded areas where plowing has exposed the subsoil. Seed germination and plant growth are poor in these areas. Except for texture of the surface layer, these soils have a profile similar to that described as typical for the series.

Included with these soils in mapping are small areas where slopes are steeper than 10 percent. Some included areas had gullies filled from the soil beside the gully.

Where slopes are stronger or erosion has been severe, these soils are better suited to hay or pasture than to row crops. Stripcropping, diversion terraces, and cover crops can be used to reduce erosion. Capability unit IIIe–2; woodland suitability group 2o1)

pose. (Capability unit IIIs–6; woodland suitability group 3s1)

Tinton sand, 5 to 10 percent slopes (TsC).—Erosion is a hazard on this soil. Its profile is similar to that described as typical for the series. Included with this soil in mapping are small areas of Freehold loamy sand.

Where it is farmed, this soil needs to be protected from water erosion. The use of cover crops and contour farming are effective erosion control practices. (Capability unit IVs–7; woodland suitability group 3s1)

Tinton sand, thick surface, 0 to 5 percent slopes (TtB).—Except that it has a combined surface and subsurface layer about 35 inches thick, this soil has a profile similar to that described as typical for the series. The subsoil is about 14 inches thick in most places. Included with this soil in mapping are about 200 acres on the south side of Rancocas Creek near Highway 38 where the subsoil was removed 30 to 50 years ago to be used as molding sand. Large areas were left rough and had many piles of sand. The mounds, though somewhat rounded on top, are still visible. All of these areas have reverted to woodland and support stands of Virginia pine.

Although it is too droughty and infertile to be used extensively for crops, this soil is best suited to deep-rooted perennials such as grapes or peaches. Where it is cleared, this soil is subject to soil blowing. (Capability unit IVs–7; woodland suitability group 3s1)

Urban Land

This land type consists of cut and fill areas, most of which have been developed for residential, commercial, or industrial use or for multilane highways. During development, the original soil horizon was destroyed in at least 70 percent of the area.

Urban land, sandy (Ug).—Most of this land is developed or awaiting development. The soil has slight limitations for industrial or commercial use, moderate limitations for woodland or wildlife use, and severe limitations for farming and dug ponds.

Areas of both cut and fill are moderately or rapidly permeable. Where the original soil was removed and the substratum exposed, the material remaining is rapidly permeable and extremely low in organic-matter content and fertility. Where the material was moved from one area to another, permeability is generally moderate, but it is slow in places because of compaction by heavy equipment.

In Willingboro, the topsoil was stockpiled, roads were constructed, and utility lines were installed in excavated ditches. The landscape was then reshaped according to design and the topsoil replaced.

In a few small areas several feet of the original soil were removed and the area was smoothed for farming again. In these places, yields are about one-half of what they had been. (Capability and woodland suitability unclassified)

Urban land, clayey (Ut).—Fill areas of this land generally contain brown clayey material, most of which was obtained from areas that had been farmed and limed. A grass cover generally is not difficult to establish on fill areas.

Cut areas generally have exposed dark-gray clayey beds of the Merchantville or Woodbury clay Formations. This material is low in organic-matter content, is slowly permeable, is extremely acid, and is subject to severe frost heaving. Any kind of plant cover is difficult to establish.

This land type has severe limitations to use for wildlife ponds. (Capability and woodland suitability unclassified)

Urban land, sandy over clayey (Uv).—This land consisted of sandy layers that were 1 to 2 feet deep over clayey beds until the original profile was destroyed in much of the area. Where the sandy part remains, it is moderately permeable in most places and slowly permeable where it has been compacted by equipment. The underlying clayey material is slowly permeable. In places water is perched over the clayey material long enough to wet the basements. Where the remaining sandy material is thin, frost-free fill may be needed before paving the area.

In Willingboro, the sandy upper part of this land has been moved and the landscape reshaped. Where the sandy material has been removed, the clayey material is now at the surface. Because it is sticky when wet and hard when dry, a vegetative cover is difficult to obtain. (Capability and woodland suitability unclassified)

Westphalia Series

The Westphalia series consists of well-drained, nearly level or gently sloping, sandy and loamy soils. These soils formed in the thick Kirkwood marine deposit, which consisted mostly of very fine and fine sands. Some of these soils were transported by water or wind. They occur on high positions in the county.

In a typical profile, the surface layer is dark grayish-brown fine sandy loam about 10 inches thick and the subsurface layer is light olive-brown fine sandy loam about 3 inches thick. The yellowish-brown subsoil extends to a depth of 42 inches. It is very fine sandy loam in the upper 17 inches and fine sandy loam below. The substratum is stratified yellowish-brown fine sand and fine sandy loam. The sands contain small amounts of mica.

Probably because of the high percentage of uniformly fine sand, these soils are moderately slow in permeability. The available water capacity is high for the fine sandy loam and moderate for the loamy fine sand. Organic-matter content is moderate for the fine sandy loam and low for the loamy fine sand. Westphalia soils are moderately fertile.

In most places the native vegetation is a mixed hardwood forest consisting of northern red oak, southern red oak, scarlet oak, white oak, black oak, yellow-poplar, holly, beech, hickory, and scattered Virginia pine. In places yellow-poplar or beech grow in nearly pure stands. Virginia pine commonly seeds in idle fields and occupies the site for some time before the hardwoods become reestablished.

Most of this acreage has been cleared for crops. The

Appendix C
Photographs

Wetland A

1. View facing southeast where Mason's Creek is culverted under the existing Runway.

2. View of wetland boring number B-6 from the lawn area adjacent to the runway culvert.

3. View facing northeast of Wetland A adjacent to Masons Creek's tributary located to the north of Runway 8-26.

4. View facing southwest of potential vernal habitat located east of Mason's Creek near the culvert.

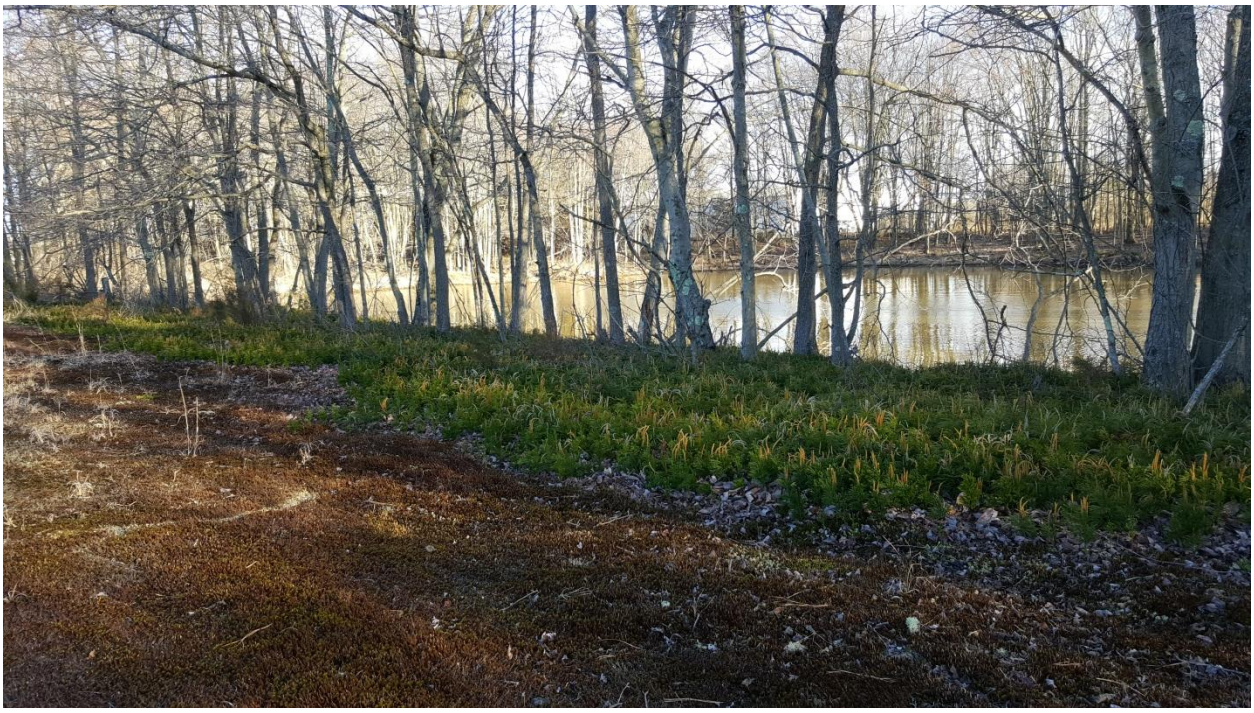
Wetland B

5. View facing north of Mason's Creek culverts.

6. View facing west along the south side of Runway 08/26.

7. View facing northeast from PFO area of Wetland B adjacent to Mason's Creek.

8. View facing northwest from Taxiway B near the main apron.



9. View facing south of the pond that is part of an unnamed tributary east of Mason's Creek.

Wetland C

10. View facing west of Taxiway A adjacent to Wetland C.

11. View facing northeast of Wetland C along Taxiway D.

12. View of wetland soil boring number B-28 within Wetland C.

Wetland D

13. View facing north from the East Apron of Wetland D's area south of the runway.

14. View facing east of the ditch adjacent to the eastern end of Runway 08/26.

15. View of wetland boring number B-26 from the agricultural field east of the runway end.

16. View of hydric soils found in wetland boring number B-26 from Wetland D.

17. View facing east of ditch at south of the eastern end of runway 08/26.

AECOM

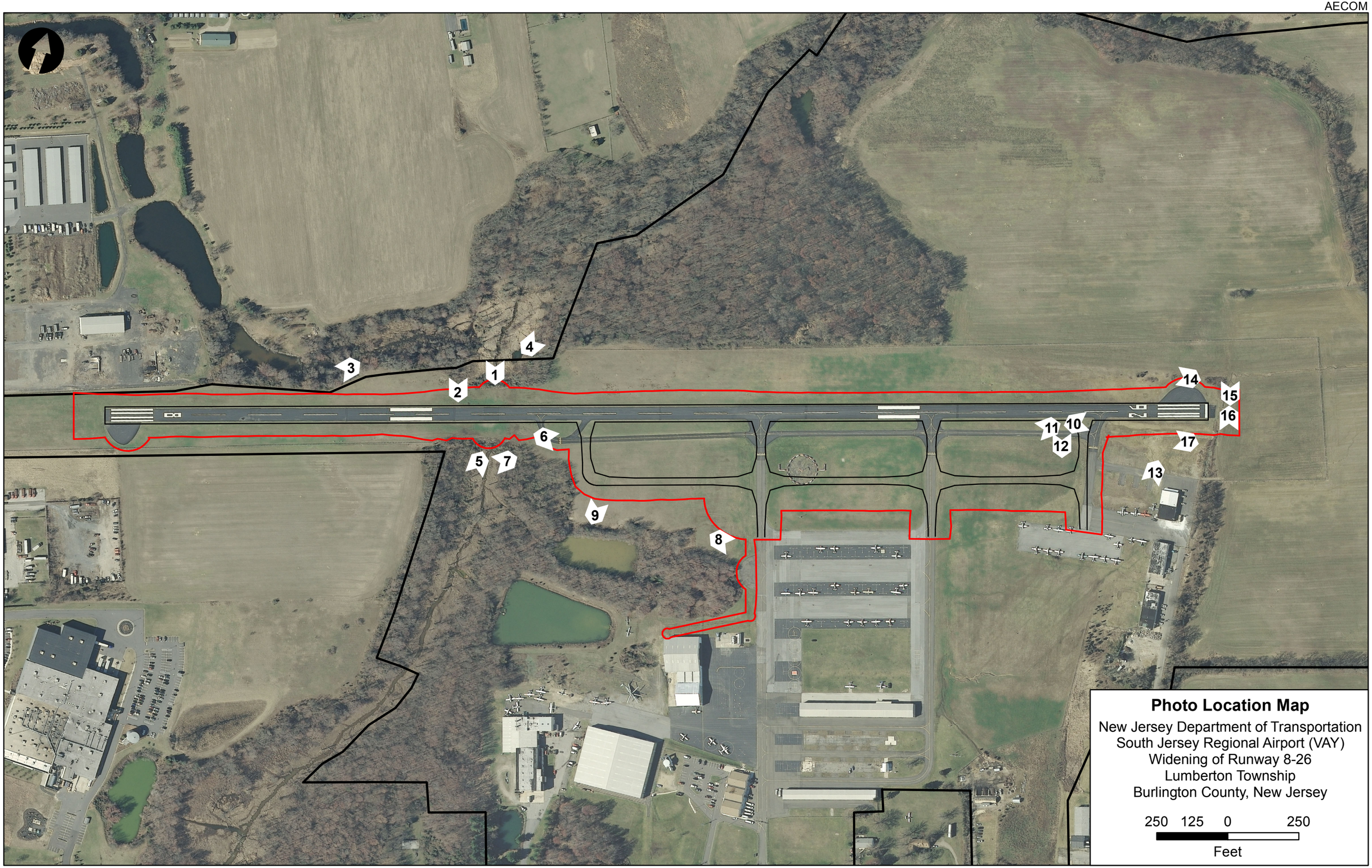


Photo Location Map

New Jersey Department of Transportation
South Jersey Regional Airport (VAY)
Widening of Runway 8-26
Lumberton Township
Burlington County, New Jersey

250 125 0 250

Feet

Appendix F
Public Involvement and EA Review Comments

Newspaper Notice

Opponent: Ark. governor not conservative enough

Andrew Demillo
ASSOCIATED PRESS

LITTLE ROCK, Ark. – Arkansas Gov. Asa Hutchinson got an "A" rating from the National Ri•e Association when he ran for governor in 2014 and can tout tax cuts he's championed since taking of•ce. But that apparently isn't enough for Jan Morgan, the owner of a gun range she once declared "Muslim-free," who is mounting an uphill bid to unseat Hutchinson in the Republican primary as not conservative enough on gun rights, taxes and other issues.

Morgan insists she has a chance to defeat Hutchinson on May 22, even though he is generally popular and she has only $16,000 in the bank to the governor's $2.4 million. She is portraying the race as emblematic of the divide among Republicans nationally and in the state.

"Asa and I are total representations of that divide. Asa is a big government, tax-and-spend establishment progressive. He is a DC insider," Morgan said. "Jan Morgan is a constitutional and •scal conservative."

Hutchinson, who ran unsuccessfully for statewide o• ce three times before being elected governor in 2014, sco• s at the description.

"Anybody who knows my history and my consistent, conservative positions in my time in the political arena almost laughs at those accusations," Hutchinson said.

Both tout themselves as gun rights defenders. Morgan gained national attention four years ago when she declared her Hot Springs range "Muslim-free." She launched her gubernatorial bid several months after Hutchinson signed legislation exempting college sporting events from a new measure expanding where concealed handguns are allowed. She also supports allowing residents to carry •rearms either openly or concealed without a license.

Hutchinson believes a license is still required to carry a concealed handgun. Hutchinson has previously received endorsements and high marks from the NRA, and headed a task force for the gun rights group that called for trained, armed sta• at schools following the 2012 Newtown, Connecticut, school shooting. The NRA has not released endorsements or grades in this year's governor's race.

Hutchinson has successfully pushed for two income tax cuts since taking of•ce – a $100 million middle-income tax cut in 2015 and a $50 million lower-income cut last year – and has proposed cutting income taxes for the state's top earners by $180 million next year. The governor last week also said he'd ask lawmakers to increase a property tax credit homeowners receive from $350 to $375. Morgan has said she'd also push for tax cuts if elected, but has not released a speci•c tax-cut plan.

Morgan has criticized Hutchinson for tax increases that he signed into law last year to o• set a measure exempting military retirement bene•ts from the income tax. To help pay for the $13 million exemption, the measure levied sales taxes on e-books, digital music and ringtones. It also called for levying the state's full 6.5 percent sales tax – rather than the lowered 5.5 percent rate for groceries – on soda and candy and made unemployment bene•ts subject to income taxes. The law also cut the tax that restaurants and retailers pay on syrup for soft drinks.

"He's played a shell game with the people," Morgan said.

Hutchinson accused Morgan of misrepresenting his record on tax cuts, and said the o• sets were needed to ensure Arkansas kept a balanced budget and didn't jeopardize other services.

"We're not Washington, D.C. We actually have to balance the budget," he said.

The two have also split over the state's hybrid Medicaid expansion, which uses federal and state funds to purchase private insurance for low-income residents. An opponent of the federal health law that allowed the expansion, Hutchinson declined during his bid four years ago to say whether he'd keep the program. Earlier this year, the federal government approved the state's plan to impose a work requirement on some recipients.

Morgan has called for ending the program and also endorsed a proposal to freeze its enrollment.

The winner of the race will face the winner of the Democratic primary, which features former education nonpro•t executive Jared Henderson and hairdresser Leticia Sanders, and Libertarian nominee Mark West.

THE NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJDOT)
NOTICE OF AVAILABILITY and REQUEST FOR COMMENT

Draft Environmental Assessment
Widening of Runway 08-26 and Ancillary Improvements
South Jersey Regional Airport, Lumberton, New Jersey

In accordance with the National Environmental Policy Act (NEPA), notice is hereby given that copies of a Draft Environmental Assessment (EA) for the construction and operation of the proposed improvements to the existing runway and taxiways at the South Jersey Regional Airport (VAY) are available for public review and comment at the following locations:

South Jersey Regional Airport
Main Office
68 Stacy Haines Road
Lumberton, NJ 08048
Attn: Airport Manager
Hours: 8 AM to 5 PM

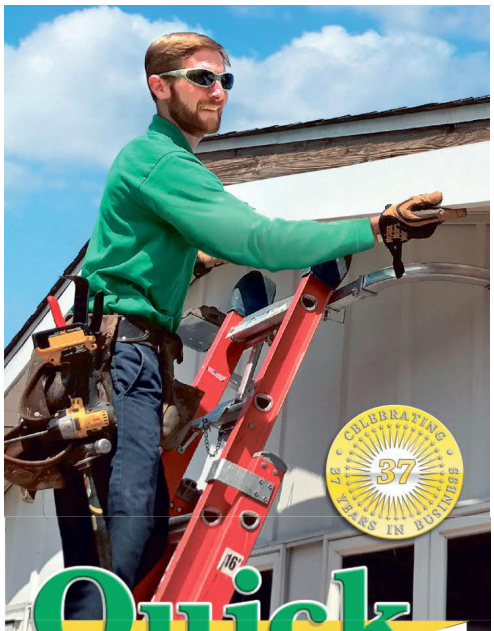
New Jersey Department of Transportation
David J. Goldberg Transportation Complex
1035 Parkway Avenue
Trenton, NJ 08625
Attn: Gerard Leipfinger
Hours: 8:30 AM to 4:30 PM

The Draft EA document for this project will be available at these locations until the close of the comment period, which is on or about May 23, 2018. In addition, a copy of this document may be viewed online at: http://www.state.nj.us/transportation/airwater/aviation/studies.shtm#southjersey

The NJDOT is inviting the Public to submit, in writing, comments on the Draft EA prepared for the proposed Widening of Runway 08-26 and Ancillary Improvements project. In addition, this opportunity for public review is provided pursuant to Federal Executive Order 11988, Floodplain Management. The NJDOT is accepting comments on this Draft EA document until the official comment period closes on or about May 23, 2018.

All comments on the Draft EA document should be sent in writing to: Gerard Leipfinger, NJDOT Bureau of Aeronautics, 1035 Parkway Avenue, P.O. Box 600, Trenton, NJ 08625-0600.

CP-8611582810



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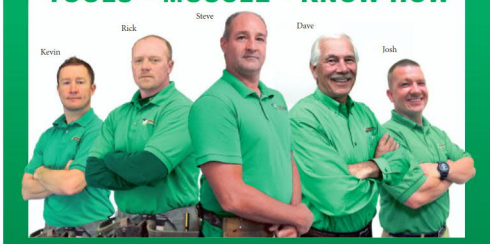

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY 15 2018

RECEIVED
MAY 21 2018
BY:

Mr. Gerard Leipfinger
New Jersey Department of Transportation
Bureau of Aeronautics 1036 Parkway Avenue
P.O. Box 600
Trenton, NJ 08625-0600

Dear Mr. Leipfinger:

The Environmental Protection Agency (EPA) has reviewed the Federal Aviation Administration's (FAA) April 2018 Draft Environmental Assessment (EA) on the proposed South Jersey Regional Airport Widening of Runway 08-26 and Ancillary Improvements. The South Jersey Regional Airport is owned by the New Jersey Department of Transportation, and located in Lumberton Township, Burlington County, New Jersey. The preferred alternative would bring both the runway and parallel taxiway up to current FAA standards in width and separation along with proper grading of the runway and surrounding Runway Safety Area. It also includes the replacement of the existing culvert crossing of Masons Creek with a three-sided rigid frame structure to accommodate peak flows of the New Jersey Flood Hazard Area design storm flood of Masons Creek beneath the runway.

The environmental assessment demonstrates a finding of no significant impact. However, EPA recommends that in future, the applicant prepare both the environmental assessment and the required wetlands and floodplain permits at the same time, so that any required mitigation will be discussed and available to the public during environmental assessment review. Preparing these documents concurrently should save time overall.

Thank you for the opportunity to comment. If you have any questions, please call Lingard Knutson at (212) 637 – 3747 or Knutson.lingard@epa.gov.

Sincerely,

Grace Musumeci, Chief
Environmental Review Section

cc: E. Gabsewics, FAA

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF PERMIT COORDINATION AND ENVIRONMENTAL REVIEW
P.O. Box 420 Mail Code 401-07J Trenton, New Jersey 08625-0420
Telephone Number (609) 292-3600

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. MCCABE
Acting Commissioner

May 22, 2018

Mr. Gerard Leipfinger
New Jersey Department of Transportation
Bureau of Aeronautics
PO Box 600
Trenton, New Jersey 08625-0990

RE: Draft Environmental Assessment (EA)
South Jersey Regional Airport Widening of Runway 08-26
Lumberton Township, Burlington County, New Jersey

Dear Mr. Leipfinger:

On April 23, 2018, the New Jersey Department of Environmental Protection's (NJDEP) Office of Permit Coordination and Environmental Review (PCER) received a Draft Environmental Assessment (EA) regarding South Jersey Regional Airport (SJRA) widening of runway 08-26, located in Lumberton Township, Burlington County, New Jersey and was prepared in accordance with the National Environmental Policy Act (NEPA). The EA analyzed if the proposed action is likely to significantly affect the environment and warrant preparation of an environmental impact statement, or whether it is appropriate for the Federal Aviation Administration (FAA) to prepare a Finding of No Significant Impact for the project.

In response to your request for a determination as to whether the proposal will have any adverse impacts to land use, historical or cultural resources, threatened and endangered species and migratory birds, or whether there are any impacts to Green Acres-encumbered parkland held by the State, local government units and/or nonprofit organizations, the Department offers the following comments for your consideration:

Natural Resources
Based on currently accepted species habitat requirements and behavioral preferences, the NJ Division of Fish & Wildlife (DFW) would concur with the information provided and the conclusions drawn. The proposed project, based on the documents reviewed and the Scope of Work, is anticipated to have little to no effect on faunal threatened/endangered species or designated critical habitat.

The Division notes the applicant plans to widen runway 08-26 by 10 foot. Additionally, the applicant proposes to add 10-foot turf shoulders along the runway and 15 foot turf shoulders along the taxiway.

Upland Sand Piper:

Page 27 of the EA states, the airport property is comprised of maintained open fields as well as agriculture lands which are both designated by NJDEP as breeding habitat for the Upland Sand Piper. Additionally, the EA states the presence of the Upland Sand piper will be presumed

within the project area. The Division would concur with this statement and require a **time restriction from 4/1 - 8/15 for any impact to the taller grassland areas** which would be considered Upper Sand Piper nesting habitat. This time restriction should already be part of the airport mowing maintenance plan.

Culvert Replacement:

Division notes the applicant plans to replace the existing (five, 48-inch CMP) culvert crossing Masons Creek with a three sided rigid frame structure. A **time restriction from 4/1 thru 6/30** needs to be imposed on any **in-water** and\or **sediment generating activities** associated with the project in order to protect warm-water fish nest building and spawning (4/1-6/30- includes waters that support pickerel) Should any tree clearing become necessary a general **timing restriction on trimming or removal of trees from 4/1 – 8/31 is recommended to protect nesting birds** covered under the NJ Endangered & Non-game Species Conservation Act.

Additionally, the Division notes the applicants consulted with the USF&W to address potential impacts to Federally listed floral and faunal threatened/endangered species or designated critical habitat. The Division supports all comments and conditions from the USF&W.

If have any questions regarding the comments please contact me at (609)-984-3859 or by email at joseph.corleto@dep.nj.gov

Land Use Permitting and Mitigation

The Division of Land Use Regulation has reviewed the "*Draft Environmental Assessment For New Jersey Department of Transportation South Jersey Regional Airport Widening of Runway 08-26 and Ancillary Improvements, Lumberton Township, New Jersey*", dated April 2018, and prepared by AECOM.

According to the Draft EIS, the improvements to runway 08-26 and parallel taxiway "A" will result in the disturbance to 3.56 acres of freshwater wetlands and will impact the flood hazard area of Mason's Creek. In addition, the improvements will impact
0.15 acres riparian zone vegetation.

The project area has been identified as potential habitat for the State endangered American kestrel, and Upland Sandpiper and the federally listed Bog turtle, Northern long-eared bat, and Swamp pink.

Because the project will impact 3.56 acres of freshwater wetlands, it will require a Freshwater Wetlands Individual Permit. And, because it will impact the flood hazard area of Mason's Creek and 0.15 acres of riparian zone vegetation, it will also require a Flood Hazard Area Permit. Through the State land use permitting process, the Division of Land Use Regulation will evaluate the project for impacts to freshwater wetlands, flood hazard areas and endangered or threatened plant and wildlife species.

According to the Draft EIS, the NJDOT concluded through a field study entitled "*Swamp Pink Survey Report, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements,* (AECOM 2017*), Supplemental Swamp Pink Survey, South Jersey Regional Airport, Widening of Runway 08-26 and Ancillary Improvements*, (AECOM 2017), that Swamp pink was not present in the project area. These reports should be included in any permit applications submitted to the Division of Land Use Regulation. A Phase 1 Survey for Bog turtle revealed potential habitat for this species. NJDOT plans to perform a Phase 2 Survey to determine the presence or absence of the species prior to final design. A copy of the Phase 1 and Phase 2 Study should be included in an permit applications submitted to the Division of Land Use Regulation.

NJDOT will be required to mitigate for the impacts to freshwater wetlands.

According to the Draft EIS, the project is not in final design. The Division of Land Use Regulation recommends NJDOT scheduling a pre-application meeting with the Division of Land Use Regulation prior to final design to discuss the permitting requirements, and measures that can be taken to minimize the project impacts.

If you have any additional questions, please contact Chris Jones at (609) 984-6216.

Mobile Sources

Diesel exhaust contributes the highest cancer risk of all air toxics in New Jersey and is a major source of NOx within the state. Therefore, NJ DEP recommends that construction projects involving non-road diesel construction equipment operating in a small geographic area over an extended period of time implement the following measures to minimize the impact of diesel exhaust:

1. All on-road vehicles and non-road construction equipment operating at, or visiting, the construction site shall comply with the three minute idling limit, pursuant to N.J.A.C. 7:27-14 and N.J.A.C. 7:27-15. Consider purchasing "No Idling" signs to post at the site to remind contractors to comply with the idling limits. Signs are available for purchase from the Bureau of Mobile Sources at 609/292-7953 or http://www.stopthesoot.org/sts-no-idle-sign.htm.

2. All non-road diesel construction equipment greater than 100 horsepower used on the project for more than ten days should have engines that meet the USEPA Tier 4 non-road emission standards, or the best available emission control technology that is technologically feasible for that application and is verified by the USEPA or the CARB as a diesel emission control strategy for reducing particulate matter and/or NOx emissions.

3. All on-road diesel vehicles used to haul materials or traveling to and from the construction site should use designated truck routes that are designed to minimize impacts on residential areas and sensitive receptors such as hospitals, schools, daycare facilities, senior citizen housing, and convalescent facilities

In addition, the applicant should be conscious of truck traffic and avoid neighborhoods as much as possible when entering and leaving the facility. After the completion of the project, it is recommended that the applicant reinforce the No Idling Law as there will be an increase of vehicle traffic at a location that is currently vacant.

If you have any additional questions, please contact Alina Nagtalon at (609) 633-2007.

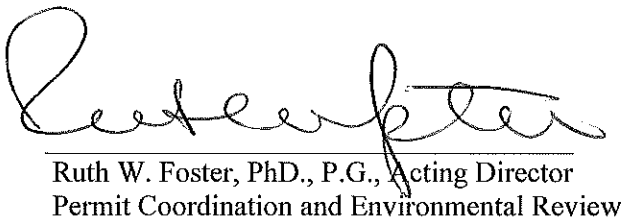
Stormwater Management

Construction projects that disturb 1 acre or more of land, or less than 1 acre but are part of a larger common plan of development that is greater than 1 acre, are required to obtain coverage under the Stormwater construction general permit (5G3). Applicants must first obtain certification of their soil erosion and sediment control plan (251 plan) form their local soil conservation district office. Upon certification, the district office will provide the applicant with two codes process (SCD certification code and 251 identification code) for use in the DEPonline portal system application. Applicants must then become a registered user for the DEPonline system and complete the application for the Stormwater Construction General Authorization. Upon completion of the application the applicant will receive a temporary authorization which can be used to start construction immediately, if necessary. Within 3-5 business days the permittee contact identified in the application will receive an email including the application summary and final authorization.

If you have any additional questions, please contact Eleanor Krukowski at (609) 633-7021.

Thank you for giving the New Jersey Department of Environmental Protection the opportunity to comment on the Draft Environmental Assessment for the proposed project. Please contact David Pepe at (609) 292-3600 if you have any additional questions or concerns.

Sincerely,



Ruth W. Foster, PhD., P.G., Acting Director
Permit Coordination and Environmental Review

c.

Joseph Corleto, NJDEP, Fish & Wildlife
Chris Jones, NJDEP, Division of Land Use Regulation
Alina Nagtalon, NJDEP, Bureau of Mobile Sources
Eleanor Krukowski, NJDEP, Stormwater
Paula Scelsi, NJDOT