

## C. Appendix C - Wetland Delineation

Appendix C includes the following:

- Wetland Delineation Technical Memorandum



# McFarland Johnson

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## TECHNICAL MEMORANDUM

**TO:** Mr. Stephen Mykulyk, P.E.  
Director of Engineering  
Wilkes-Barre/Scranton International Airport

**FROM:** Thomas C. Wirickx, CSE, PWS, QAWB  
Senior Environmentalist  
McFarland Johnson, Inc.

**DATE:** December 14, 2017

**SUBJECT:** Wilkes-Barre/Scranton International Airport  
Airport Master Plan Update  
Wetlands and Surface Waters Delineation

**PROJECT NO.:** 18085.00

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### INTRODUCTION

McFarland Johnson, Inc. was retained by Wilkes-Barre/Scranton International Airport (AVP) to evaluate the Airport through preparation of an airport master plan update (MPU), to assure that the Airport and its environs are safe and efficient as well as to evaluate the growing needs of the airport users and the aviation needs of surrounding communities. As part of the MPU, this memorandum has been prepared as a planning level document to summarize the locations and characteristics of the wetlands and surface waters identified within the undeveloped portions of AVP owned property

The wetlands and surface waters delineation Project Study Area (PSA) encompasses a combined 335.87 acres as shown on the attached Wetlands and Surface Waters Delineation Plans included in Appendix A. A description of the methodology used to delineate and classify the wetlands and surface waters is provided in the following sections.

## **METHODOLOGY**

### **Desktop Review**

Prior to the field survey of the property, aerial photographs, various maps and other resources were reviewed. These included:

- a) United States Geological Survey (USGS) Topographic Map, Figure 1
- b) National Wetlands Inventory (NWI) Map, Figure 2
- c) Federal Emergency Management Agency (FEMA) Floodplain Mapping, Figure 3
- d) United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Map, Figure 4.

These figures have been attached to this memorandum in Appendix B.

### **Field Data Collection**

Field data collection of the wetlands and waterways within the 335.87-acre PSA were completed by MJ over multiple field visits in late October and early November of 2015.

Wetland boundaries were delineated through field investigations of vegetation, soils and hydrology in accordance with the 1987 *USACE Wetlands Delineation Manual* (1987 USACE Manual) and 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (2012 Regional Supplement).

The United States Army Corps of Engineers (USACE) Ordinary High Water (OHW) for any streams or other waterbodies located within the project study areas were field delineated in accordance the definitional criteria as presented in Title 33, Code of Federal Regulations, Part 328 (33 CFR 328).

The wetland and waterway boundaries were surveyed using a hand-held Trimble GPS Pathfinder ProXH receiver with H-Star technology capable of decimeter (10 cm/ 4 in) post processing accuracy. USACE Wetland Determination Data Forms were recorded for each delineated wetland (see Appendix C). Representative photographs of the wetlands and waterways were also collected (see Appendix D).

## **RESULTS**

### **Desktop Review**

The USGS topographical mapping of the PSAs indicated that Lidy Creek transverses portions of the PSA, however no wetlands were indicated.

The NWI mapping prepared by the USFWS did not indicate the potential for wetlands to exist within the PSA. NWI mapping does not have any regulatory consequence, but rather indicates

areas that may meet federal wetland criteria as identified by the USFWS using aerial photography.

Review of the most current FEMA Flood Insurance Rate Mapping (FIRM) of the PSA shows portions of the current and former flow path of Lidy Creek has a designated 100-year floodplain associated with it. The most current mapping for the portion of Lidy Creek within the PSA, dated November 2, 2012, does reflect the relocated path of Lidy Creek that was completed during the Runway 4 Extension Project. It is assumed that the floodplain would follow the same elevation marks along the relocated section of Lidy Creek.

The USDA-NRCS soils mapping indicated that there are hydric and partially hydric soils mapped within the PSA. The mapped hydric soils are primarily associated with the approximate location of the historic flow path of Lidy Creek. and its associated tributaries.

**Field Delineation**

The results of the wetlands and surface waters delineation indicated the potential for federally and State-regulated wetlands and waterways to exist within the PSA. A total of ten wetlands, Wetlands A through J, were identified during the wetlands and waterways delineation. In addition, a total of eight streams, Streams 1 through 9, and four freshwater ponds, Pond 1 through 4, were identified during the wetlands and surface waters delineation. The locations of the identified wetland and surface water resources are shown in the Wetlands and Surface Waters Delineation Plans (Appendix A).

The following tables below summarize the wetlands and surface waters identified during the delineation effort.

Wetlands within the 335.87-Acre PSA				
Feature ID	Feature Type	Acres	PADEP Regulated	USACE Regulated
Wetland A	PEM	0.14	Yes	No
Wetland B	PEM	0.34	Yes	Yes
Wetland B	PFO	0.38	Yes	Yes
Wetland C	PEM	0.21	Yes	Yes
Wetland D	PEM	0.18	Yes	Yes
Wetland E	PEM	1.01	Yes	Yes
Wetland E	PFO	0.58	Yes	Yes
Wetland F	PEM	1.05	Yes	Yes
Wetland G	PEM	0.13	Yes	No
Wetland H	PFO	0.91	Yes	Yes
Wetland I	PFO	0.44	Yes	Yes
Wetland J	PEM	0.14	Yes	No

Wetland Feature Types

- PEM- Palustrine Emergent
- PFO- Palustrine Forest Wetland

Surface Waters within 335.87 Acre PSA					
Feature ID	Feature Type	Linear Feet	Acres	PADEP Regulated	USACE Regulated
Stream 1	PER	5,234	---	Yes	Yes
Stream 2	EPH	235	---	Yes	Yes
Stream 3	EPH	157	---	Yes	Yes
Stream 4	PER	648	---	Yes	Yes
Stream 5	PER	414	---	Yes	Yes
Stream 6	INT	951	---	Yes	Yes
Stream 7	INT	252	---	Yes	Yes
Stream 8	INT	250	---	Yes	Yes
Stream 9	INT	643	---	Yes	Yes
Pond 1	PUB	---	0.21	Yes	No
Pond 2	PUB	---	0.02	Yes	No
Pond 3	PUB	---	0.03	Yes	No
Pond 4	PUB	---	0.03	Yes	No

Surface Water Feature Types

- EPH- Ephemeral Stream
- INT- Intermittent Stream
- PER- Perennial Stream
- PUB- Palustrine Unconsolidated Bottom

**JURISDICTIONAL STATUSES SUMMARY**

Portions of Wetlands B, C, D and E consist of created wetlands. According to collective information located in the PADEP Bulletin and PADEP eFACTS Database, under PADEP Permit No. E40-533, issued on June 12, 2001, the Airport was required to create 1.56 acres of wetlands as compensatory mitigation for wetland impacts associated with a previous terminal expansion consisting of a parking garage and an access roadway, and other miscellaneous commercial development at the Airport. In addition, as part of the permitting requirements under PADEP Permit No. E40-533, much of the area surrounding Wetlands B, C, D, E, F, H, and I have had permanent conservation easements placed over them. The approximate location of the conservation easements and approximate design plan locations of the four wetland mitigation areas are shown on the Wetlands and Surface Waters Delineation Plans (Appendix A)

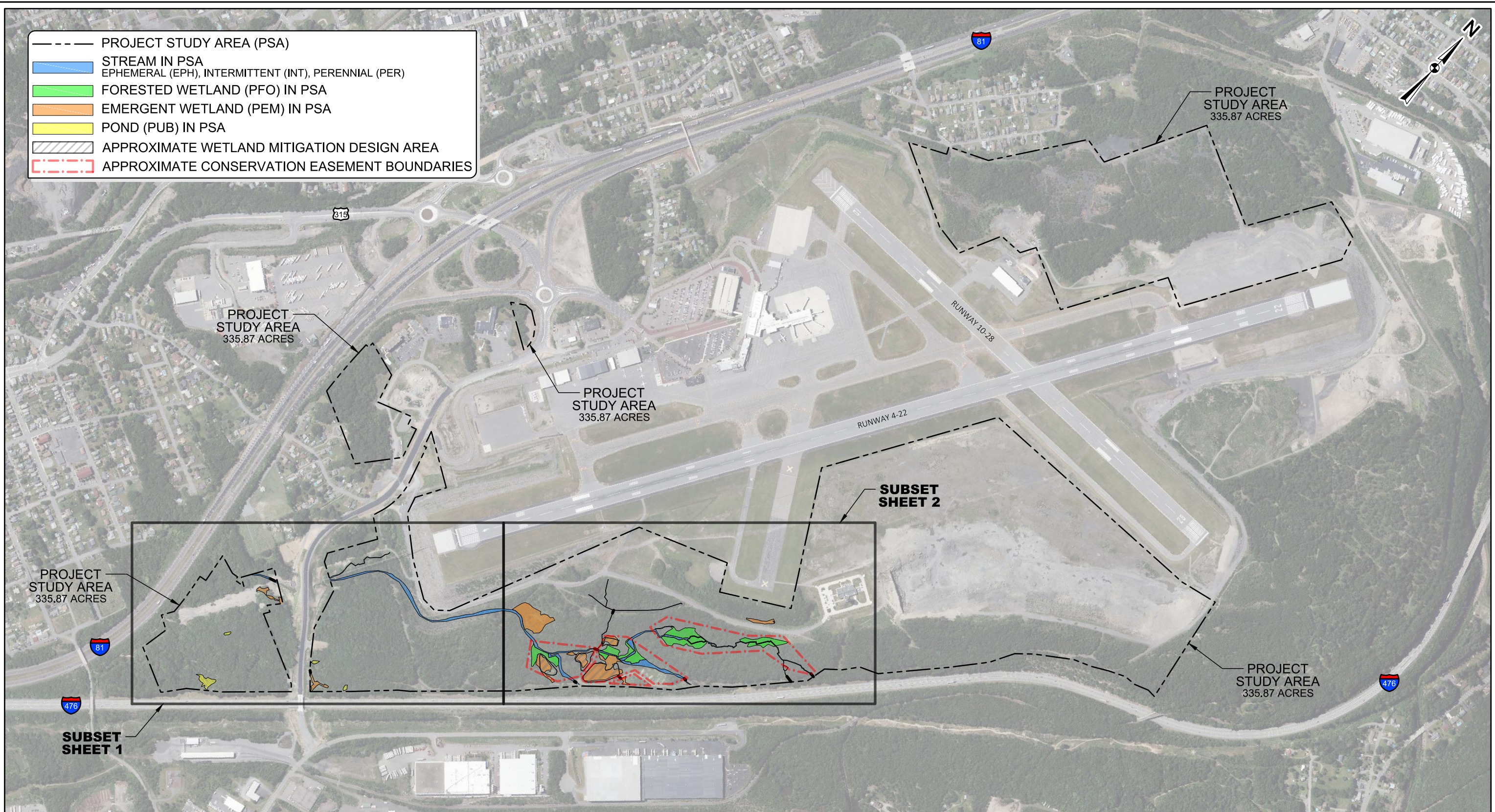
The jurisdictional statuses and boundaries for all wetlands will need to be confirmed by the PADEP and USACE. However, it is the opinion of McFarland Johnson that all delineated wetlands, except Wetlands A, G and J, possess a hydrologic connection to a TNW and are jurisdictional under Section 404 of the CWA. Wetlands A, G and J have no significant nexus to a TNW and should not be considered jurisdictional.

The jurisdictional statuses and boundaries for all surface waters will need to be confirmed by the PADEP and USACE. However, it is the opinion of McFarland Johnson that all delineated streams possess a hydrologic connection to a TNW and are jurisdictional under Section 404 of

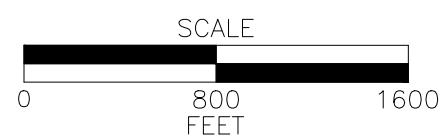
the CWA. All identified ponds are considered isolated surface mine impoundments, and should not be considered regulated under Section 404 of the CWA. Furthermore, it is believed all identified streams and ponds are considered “Waters of the Commonwealth” and are regulated under 25 Pa. Code Chapter 105.

# APPENDIX A

- PROJECT STUDY AREA (PSA)
- STREAM IN PSA  
EPHEMERAL (EPH), INTERMITTENT (INT), PERENNIAL (PER)
- FORESTED WETLAND (PFO) IN PSA
- EMERGENT WETLAND (PEM) IN PSA
- POND (PUB) IN PSA
- ▨ APPROXIMATE WETLAND MITIGATION DESIGN AREA
- ▤ APPROXIMATE CONSERVATION EASEMENT BOUNDARIES



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WILKES-BARRE/SCRANTON  
INTERNATIONAL AIRPORT  
AVOCA, PENNSYLVANIA

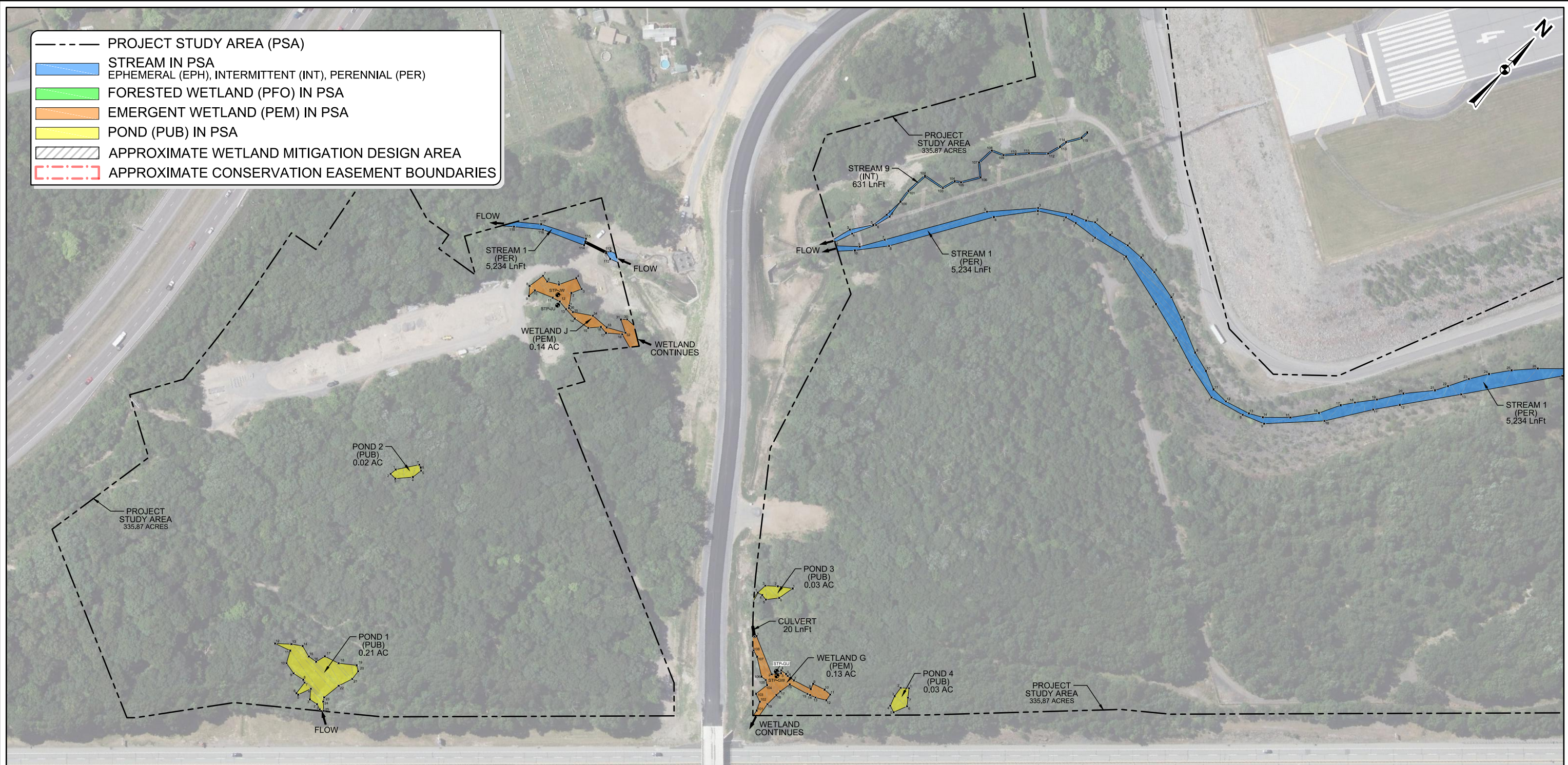
**WETLANDS AND SURFACE WATERS DELINEATION**  
**OVERALL PLAN**

SCALE: 1" = 800'	DATE: FEBRUARY 2017	FIGURE: WDP-1
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**McFarland Johnson**



- PROJECT STUDY AREA (PSA)
- STREAM IN PSA  
EPHEMERAL (EPH), INTERMITTENT (INT), PERENNIAL (PER)
- FORESTED WETLAND (PFO) IN PSA
- EMERGENT WETLAND (PEM) IN PSA
- POND (PUB) IN PSA
- APPROXIMATE WETLAND MITIGATION DESIGN AREA
- APPROXIMATE CONSERVATION EASEMENT BOUNDARIES



**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

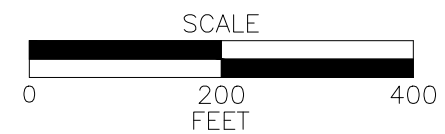
FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
WETLAND A	PEM	0.14	---	YES	NO
WETLAND B	PEM	0.34	---	YES	YES
WETLAND B	PFO	0.38	---	YES	YES
WETLAND C	PEM	0.21	---	YES	YES
WETLAND D	PEM	0.18	---	YES	YES
WETLAND E	PEM	1.01	---	YES	YES
WETLAND E	PFO	0.58	---	YES	YES
WETLAND F	PEM	1.05	---	YES	YES
WETLAND G	PEM	0.13	---	YES	NO

**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
WETLAND H	PFO	0.91	---	YES	YES
WETLAND I	PFO	0.44	---	YES	YES
WETLAND J	PEM	0.14	---	YES	NO
STREAM 1	PER	---	5,234	YES	YES
STREAM 2	EPH	---	235	YES	YES
STREAM 3	EPH	---	157	YES	YES
STREAM 4	PER	---	648	YES	YES
STREAM 5	PER	---	414	YES	YES
STREAM 6	INT	---	951	YES	YES

**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
STREAM 7	INT	---	252	YES	YES
STREAM 8	INT	---	250	YES	YES
STREAM 9	INT	---	643	YES	YES
POND 1	PUB	0.21	---	YES	NO
POND 2	PUB	0.02	---	YES	NO
POND 3	PUB	0.03	---	YES	NO
POND 4	PUB	0.03	---	YES	NO



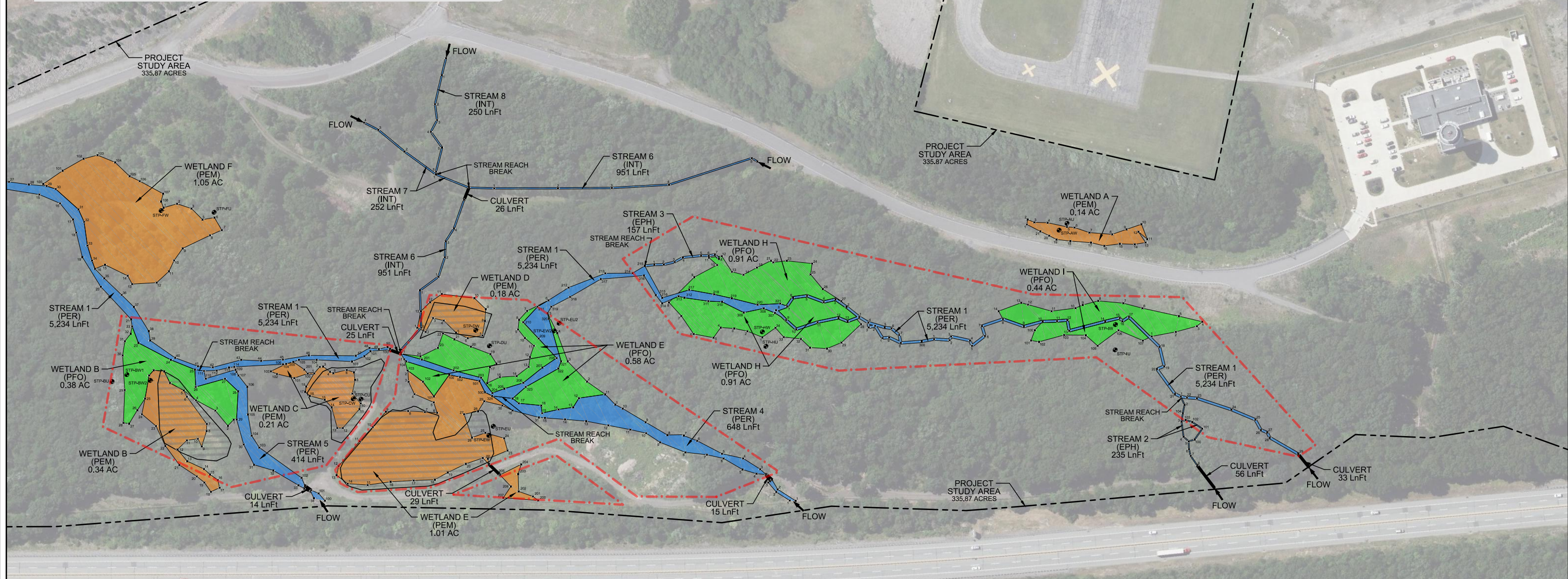
WILKES-BARRE/SCRANTON  
INTERNATIONAL AIRPORT  
AVOCA, PENNSYLVANIA

**WETLANDS AND SURFACE WATERS DELINEATION  
SUBSET PLAN 1**

SCALE: 1" = 200' DATE: FEBRUARY 2017 FIGURE: WDP-2



- PROJECT STUDY AREA (PSA)
- STREAM IN PSA  
EPHEMERAL (EPH), INTERMITTENT (INT), PERENNIAL (PER)
- FORESTED WETLAND (PFO) IN PSA
- EMERGENT WETLAND (PEM) IN PSA
- POND (PUB) IN PSA
- APPROXIMATE WETLAND MITIGATION DESIGN AREA
- APPROXIMATE CONSERVATION EASEMENT BOUNDARIES



**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

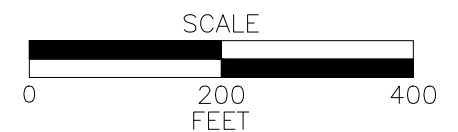
FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
WETLAND A	PEM	0.14	---	YES	NO
WETLAND B	PEM	0.34	---	YES	YES
WETLAND B	PFO	0.38	---	YES	YES
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WETLAND E	PEM	1.01	---	YES	YES
WETLAND E	PFO	0.58	---	YES	YES
WETLAND F	PEM	1.05	---	YES	YES
WETLAND G	PEM	0.13	---	YES	NO

**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
WETLAND H	PFO	0.91	---	YES	YES
WETLAND I	PFO	0.44	---	YES	YES
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STREAM 3	EPH	---	157	YES	YES
STREAM 4	PER	---	648	YES	YES
STREAM 5	PER	---	414	YES	YES
STREAM 6	INT	---	951	YES	YES

**WETLANDS AND SURFACE WATERS  
WITHIN 335.87 ACRE PROJECT STUDY AREA**

FEATURE ID	FEATURE TYPE	ACRES	LINEAR FEET	PADEP REGULATED	USACE REGULATED
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STREAM 9	INT	---	643	YES	YES
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POND 2	PUB	0.02	---	YES	NO
POND 3	PUB	0.03	---	YES	NO
POND 4	PUB	0.03	---	YES	NO



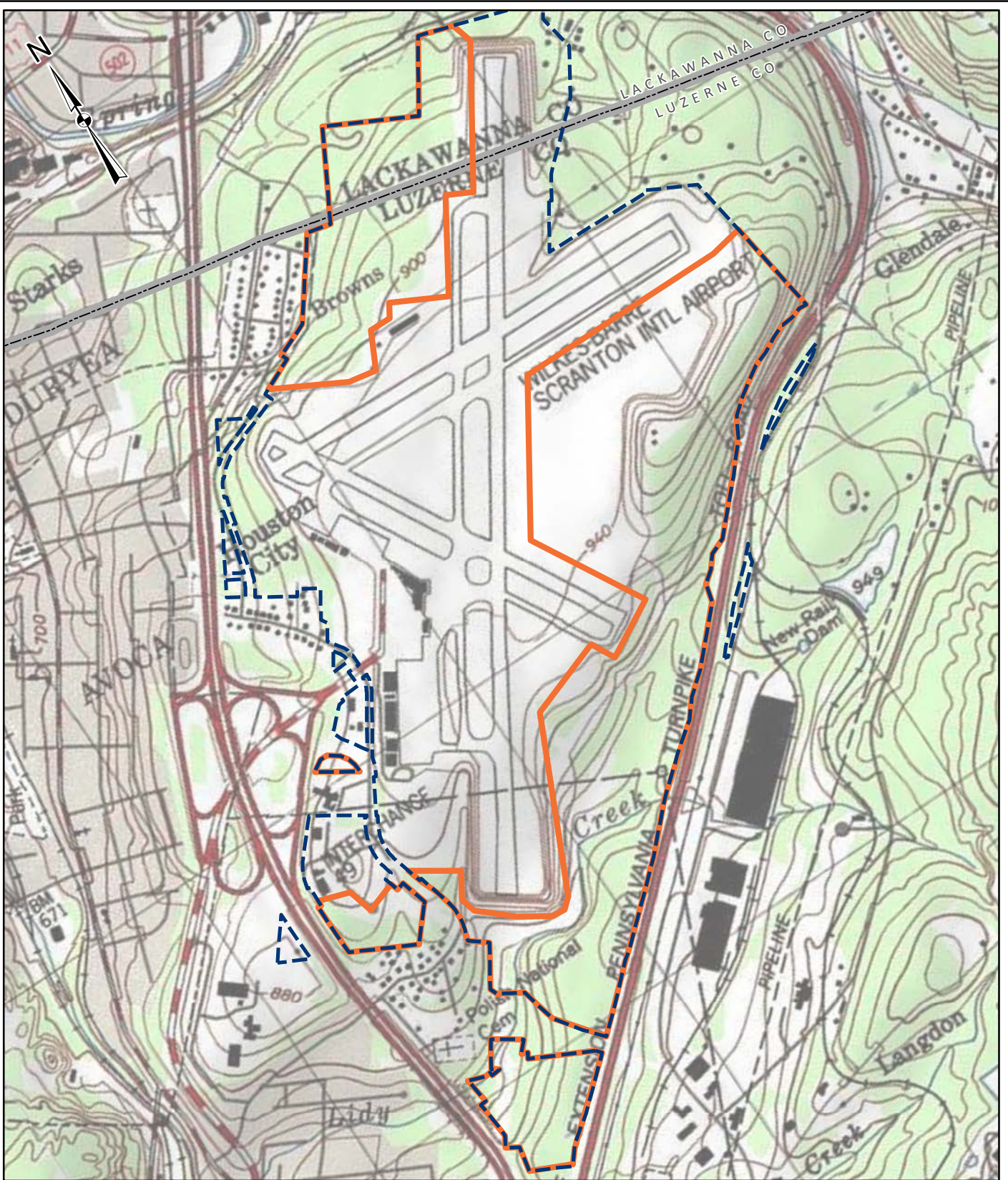
WILKES-BARRE/SCRANTON INTERNATIONAL AIRPORT  
AVOCA, PENNSYLVANIA

**WETLANDS AND SURFACE WATERS DELINEATION  
SUBSET PLAN 2**




SCALE: 1" = 200'    DATE: FEBRUARY 2017    FIGURE: WDP-3

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# APPENDIX B



**Legend**

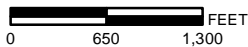
-  Airport Boundary
-  Wetland Delineation Areas
-  County Boundaries

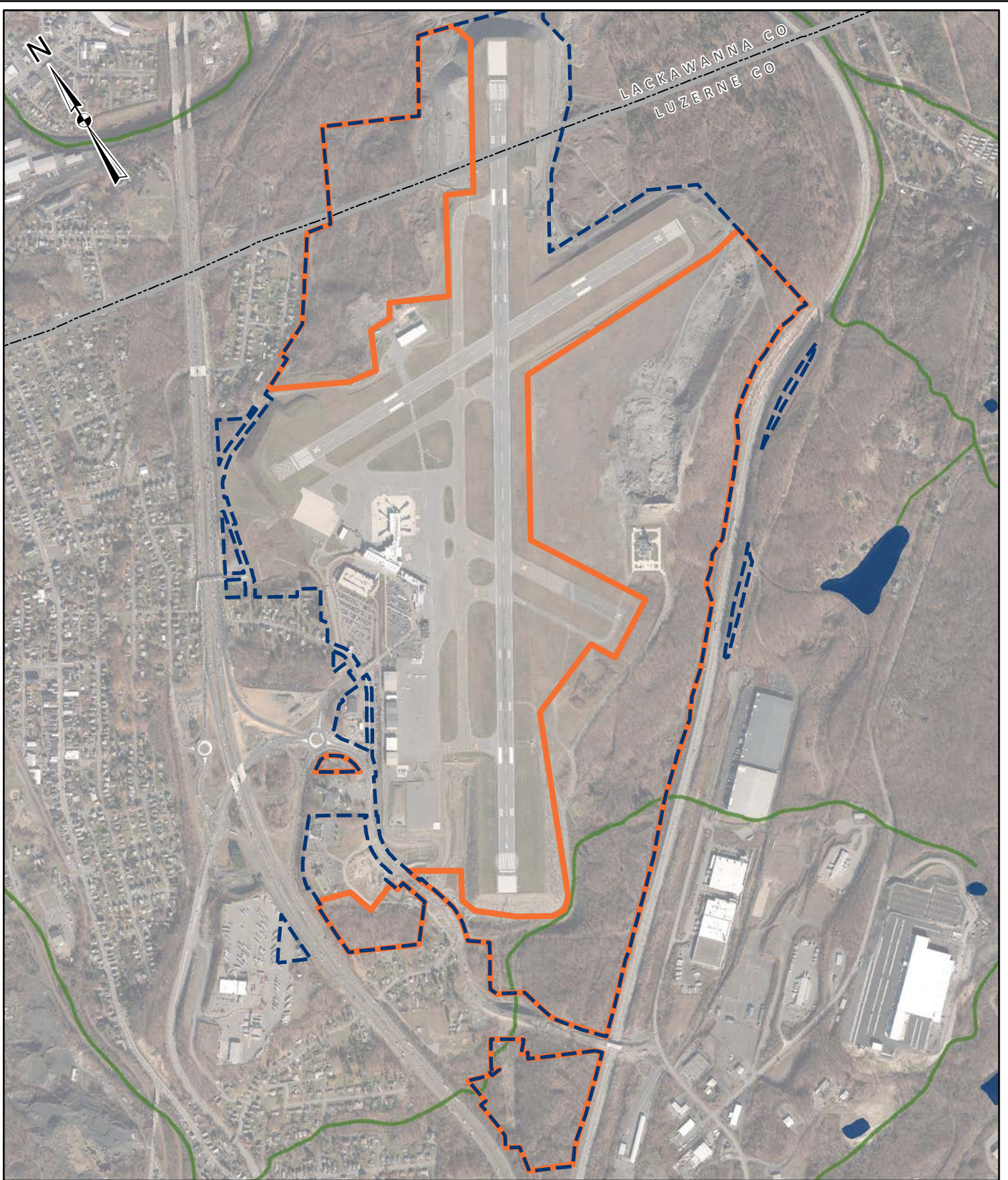
WILKES-BARRE/SCRANTON AIRPORT  
LACKAWANNA & LUZERNE COUNTIES, PENNSYLVANIA

USGS TOPOGRAPHICAL MAP




SCALE : AS SHOWN	DATE : MARCH 2017	FIGURE : 1
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Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed  
County Boundaries provided by 2010 Census  
Airport Boundary and Wetland Delineation Areas provided by McFarland Johnson










**Legend**

-  Airport Boundary
-  Wetland Delineation Areas
-  County Boundaries

**National Wetland Inventory**

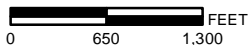
-  Lake
-  Riverine
-  Freshwater Pond
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub

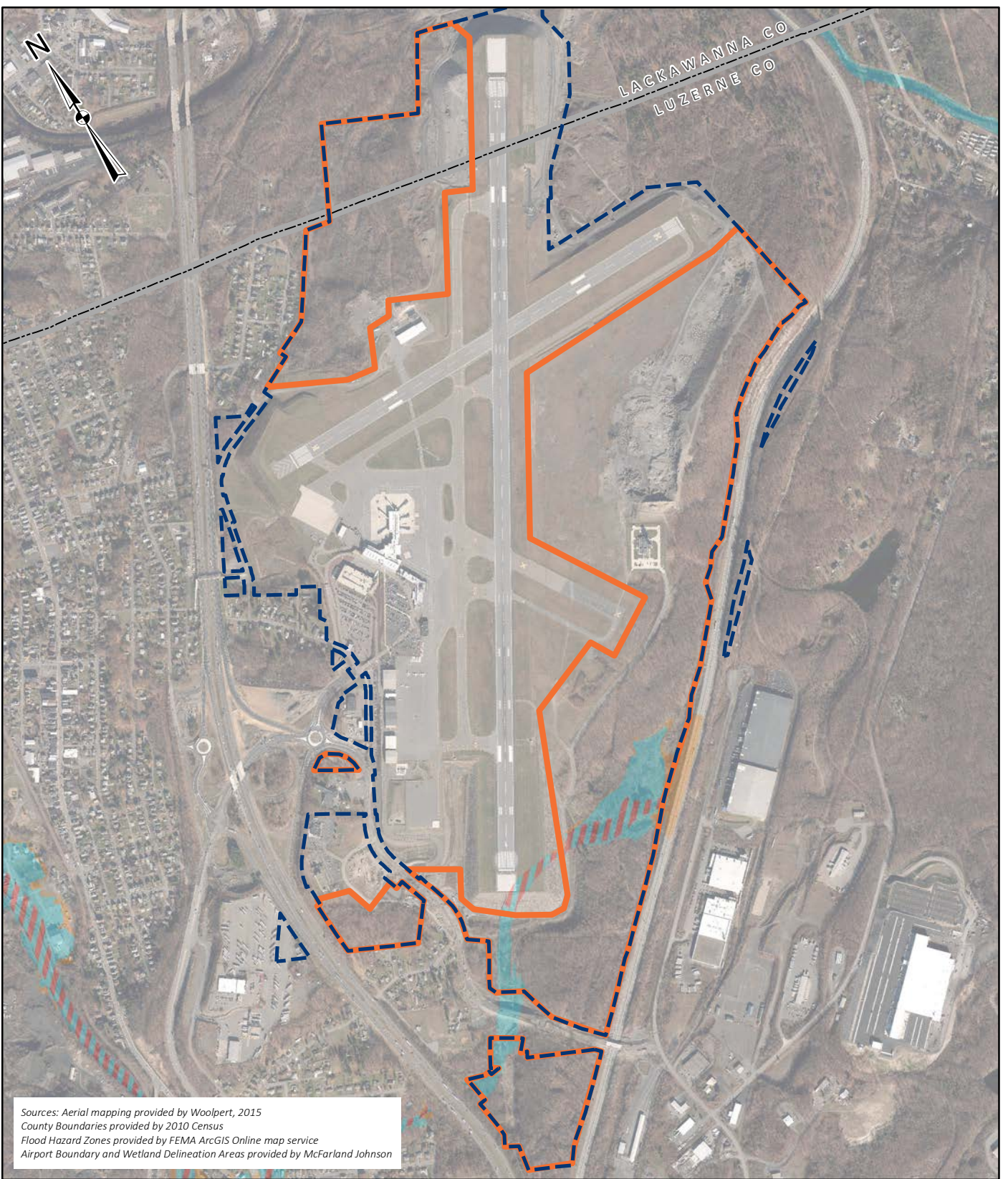
WILKES-BARRE/SCRANTON AIRPORT  
LACKAWANNA & LUZERNE COUNTIES, PENNSYLVANIA

NATIONAL WETLAND  
INVENTORY MAP

SCALE : AS SHOWN	DATE : MARCH 2017	FIGURE : 2
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Sources: Aerial mapping provided by Woolpert, 2015  
County Boundaries provided by 2010 Census  
National Wetland Inventory provided by US Fish and Wildlife Services  
Airport Boundary and Wetland Delineation Areas provided by McFarland Johnson

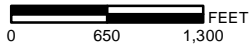




Sources: Aerial mapping provided by Woolpert, 2015  
 County Boundaries provided by 2010 Census  
 Flood Hazard Zones provided by FEMA ArcGIS Online map service  
 Airport Boundary and Wetland Delineation Areas provided by McFarland Johnson

**Legend**

-  Airport Boundary
-  Wetland Delineation Areas
-  County Boundaries
-  1% Annual Chance Flood Hazard
-  Regulatory Floodway
-  Special Floodway
-  Area of Undetermined Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard
-  Area with Reduced Risk Due to Levee

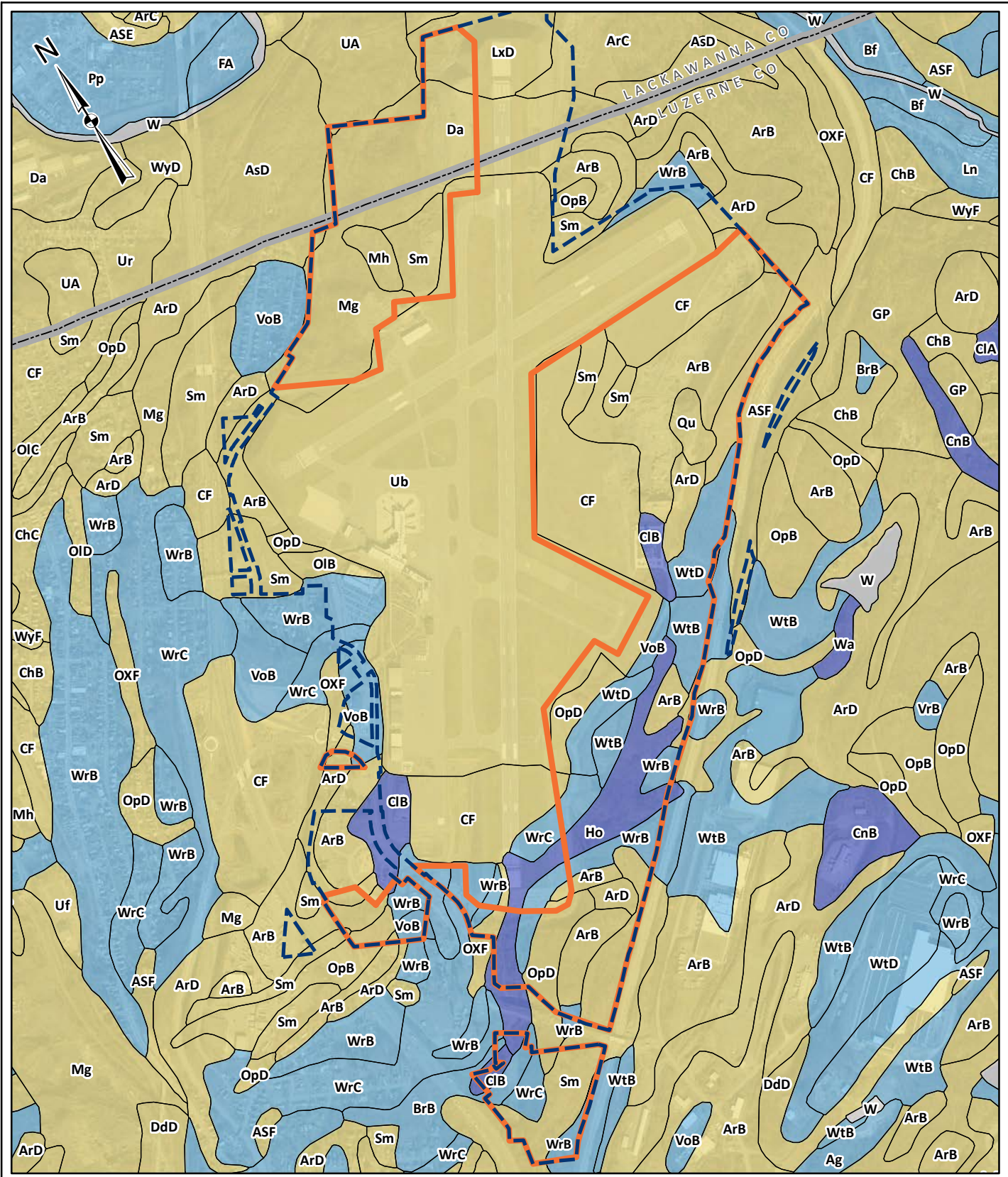


**WILKES-BARRE/SCRANTON AIRPORT  
 LACKAWANNA & LUZERNE COUNTIES, PENNSYLVANIA**

**FEMA FLOODPLAIN MAP**




SCALE : AS SHOWN	DATE : MARCH 2017	FIGURE : 3
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**Legend**

-  Airport Boundary
-  Wetland Delineation Areas
-  County Boundaries

**Hydric Soil Classification**

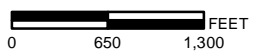
-  All hydric
-  Partially hydric
-  Not hydric
-  Unknown

**WILKES-BARRE/SCRANTON AIRPORT**  
LACKAWANNA & LUZERNE COUNTIES, PENNSYLVANIA

**NRCS SOILS MAP**

SCALE : AS SHOWN	DATE : MARCH 2017	FIGURE : 4
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Sources: Aerial mapping provided by Woolpert, 2015  
County Boundaries provided by 2010 Census  
NRCS Soils data provided by NRCS ArcGIS Online map service  
Airport Boundary and Wetland Delineation Areas provided by McFarland Johnson



# APPENDIX C



# APPENDIX D

**WILKES-BARRE/ SCRANTON INTERNATIONAL AIRPORT  
MASTER PLAN UPDATE  
WETLANDS AND SURFACE WATERS DELINEATION**



**Representative Photograph of Wetland A (PEM) Within The PSA**



**Representative Photograph of Wetland B (PEM) Within The PSA**

**WILKES-BARRE/ SCRANTON INTERNATIONAL AIRPORT  
MASTER PLAN UPDATE  
WETLANDS AND SURFACE WATERS DELINEATION**



**Representative Photograph of Wetland B (PFO) Within The PSA**



**Representative Photograph of Wetland C (PEM) Within The PSA**

**WILKES-BARRE/ SCRANTON INTERNATIONAL AIRPORT  
MASTER PLAN UPDATE  
WETLANDS AND SURFACE WATERS DELINEATION**



**Representative Photograph of Wetland D (PEM) Within The PSA**



**Representative Photograph of Wetland E (PEM) Within The PSA**