REQUIREMENT L ENVIRONMENTAL ASSESSMENT FORM



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION and U.S. ARMY CORPS OF ENGINEERS

ENVIRONMENTAL ASSESSMENT FORM (E.A. Form)

PART 1 - RESOURCE IDENTIFICATION

	1.	Indicate water	resources	which	exist on	the	project	sit
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Name of streams(s) and/or body of water (including wetlands) See Tables 3 and 4 in Enclosure A

Size of body of water (in acres) See Tables 3 and 4 in Enclosure A

Provide a table detailing all proposed aquatic resource impacts including type of structure or activity, length and width of streams or floodways, and acreage of wetlands or other bodies of water. All structures or activities must also include latitude and longitude for each proposed location.

Wetland - If wetlands are present at the project site, provide the following information relative to the person(s) or organization performing the wetland identification, delineation and related work (attach additional sheets if needed):

Last Name	First Name	MI	Telephone		
Rucker	Kevin	R	717-732-8576		
Mailing Address	City	State	Zip + 4		
2020 Good Hope Road	Enola	PA	17025		
Email Address krucker@dawood.cc					

QUALIFICATIONS

38 Hour US Army Corps of Engineers Wetland Delineator Certification Program

12 years professional experience

If wetlands are present, attach a copy of the wetland delineation report identified and labeled as **Enclosure A**. Include all field data sheets, denote the size (in acres) of the wetland. If this information details any physical information or features not shown in the "site plan" please attach additional plans which illustrate these features.

Enclosure A

	PART 1 - RESOURCE IDENTIFICATION (continued)		
2.	Is the site located within or adjacent to any of the following? Please mark either the "yes" or "no" column for each question.		
	A. National, state or local park, forest or recreation area	\boxtimes	
	B. Natural, wild, or wilderness area		\boxtimes
	C. National natural landmark		\boxtimes
	D. National wildlife refuge, or Federal, state, local or private wildlife or plant sanctuaries		\boxtimes
	E. State Game Lands		\boxtimes
	F. Areas identified as prime farmland	\boxtimes	
	If not included in the permit application package, please attach a map (e.g. 1:2400 scale or greater) indicating the location of the project, all water resources and the features identified above. Label the map as Enclosure B .	ENCLO B	
3.	Is the water resource listed as trout stocked waters by the Pennsylvania Fish and Boat Commission?		
4.	Is the water resource designated as a wild trout stream by the Pennsylvania Fish and Boat Commission?		
5.	Is the water resource listed as High Quality or Exceptional Value in Title 25 Pa. Code Chapter 93?		
	Indicate the stream classification found in Chapter 93. Classification Schuylkill River Basin – WWF, Hay Creek - CWF		
6. Is the water resource designated as a National Wild or Scenic River or as part of the Commonwealth's Scenic Rivers System or classified as priority 1-A for inclusion in the system?			
7. Is the water resource part of or located along a private or public water supply?			
	(IF COMPLETING A SMALL PROJECT APPLICATION ADVANCE TO PART 3)	E	•
8.	Provide a written narrative, identified and labeled as "Enclosure C - Description of Aquatic Habitat," discussing the following ecological functions:	N	-
	A. Aquatic habitats including:		
	(1) Food chain production		
	(2) General habitat		•
	a. Nesting e. Migration b. Spawning f. Feeding	C)
c. Rearing g. Escape Cover d. Resting h. Other			•
(3) Habitat for Federal threatened and endangered plant and animal species or State			l
	T&E species or species of special concern (Discuss results of the PNDI Receipt and Bog Turtle Habitat Screening)	R	2
	(4) Environmental Study Areasa. Sanctuariesb. Refuges	E	:
	(5) If project proposes a stream relocation, a stream enclosure, or dredging, provide a description of the instream macroinvertebrate community.	C	;

П		PART 1 - RESOURCE IDENTIFICATION (continued)	
	R	Water Quantity and Streamflow	E
	<u> </u>	(1) Natural drainage patterns	N
		(2) Flushing characteristics	С
		(3) Current patterns	L
		(4) Groundwater discharge for baseflow	0
		(5) Natural recharge area for ground and surface waters	S
		(6) Storm and floodwater storage and control	U
	C.	Water Quality	R
		(1) Preventing Pollution	E
		(2) Sedimentation control and patterns	
		(3) Salinity distribution	С
		(4) Natural water filtration	
	D.	Recreation	
		(1) Game Species	Description
		(2) Non Game Species	of A
		(3) Fishing	Aquatic Habitat
		(4) Hiking	Habitat
		(5) Observation (plant/wildlife)	
		(6) Other	
	E.	Upstream and Downstream Property	
		(1) Public Water Supplies (PWS)	
	F.	Other Environmental Factors Determined by Site Investigation	
		PART 2 - PROJECT DESCRIPTION	
9.	Pro	pject Impacts	_
	Eo	r imports to regulated waters of the Commonwealth, answer fully, completely and in detail	E
		r impacts to regulated waters of the Commonwealth, answer fully, completely and in detail e following questions; attach and label as Enclosure D .	N
			С
	Α.	Discuss the impacts on:	0
		(1) National, state or local park, forest or recreation area	S
		(2) Natural, wild, or wilderness area	U
		(3) National, state, or local historic site	R
		(4) National natural landmark	E E
		(5) National wildlife refuge	
		(6) Cultural or archaeological landmarks	D
		(7) State Game Lands	ט

		PART 2 - PROJECT DESCRIPTION (continued)	
	(8)	Federal, state, local or private plant or wildlife sanctuaries	
	(9)	Areas identified as prime farmland	
В.	Disc	cuss the environmental impacts on:	
	(1)	Aquatic habitats including:	
		a. Food Chain production	
		b. General habitat	
		(1) Nesting(2) Spawning(5) Migration(6) Feeding	Е
		(3) Rearing (7) Escape Cover	N
		(4) Resting (8) Other	_
		c. Habitat for threatened and endangered plant and animal species	С
		d. Environmental Study Areas (1) Sanctuaries	L
		(1) Sanctuaries (2) Refuges	Ο
	(2)	Water Quantity and Streamflow	S
		a. Natural drainage patterns	
		b. Flushing characteristics	U
		c. Current patterns	R
		d. Groundwater discharge for baseflow	E
		e. Natural recharge area for ground and surface waters	
		f. Storm and floodwater storage and control	_
	(3)	Water Quality	D
		a. Preventing Pollution	
		b. Sedimentation control and patterns	
		c. Salinity distribution	Project
		d. Natural water filtration	Impacts
	(4)	Recreation	
		a. Game Species	
		b. Non Game Species	
		c. Fishing	
		d. Hiking	
		e. Observation (wildlife) f. Other	
	/E\		
	(5)	Upstream and downstream property a. Public Water Supplies	
	(6)	a. Public Water Supplies Other Environmental Factors	
	(6)	Other Environmental Factors	

 C. Identify all environmental impacts on other adjacent land and water resources associated with the construction, modification or operation of the dam, reservoir, water obstruction, or encroachment in the area of the project. D. Identify and evaluate the potential cumulative environmental impacts of this project and 	E	PART 2 - PROJECT DESCRIPTION (continued)
D. Identify and evaluate the potential cumulative environmental impacts of this project and	N C L	with the construction, modification or operation of the dam, reservoir, water obstruction,
other potential or existing projects like it, and the impacts that may result through numerous piecemeal changes to the resource.	O S	other potential or existing projects like it, and the impacts that may result through
E. Identify and describe all other dams, water obstructions or encroachments which may or will be needed, in addition to those described in this Application, to fulfill the purpose of the current project.	R E	will be needed, in addition to those described in this Application, to fulfill the purpose of

PART 3 – CERTIFICATION AND FEE

I certify that the above statements, attachments including those labeled and identified as Enclosures, and all conclusions are true, correct, and based upon current environmental principles and science, to the best of my knowledge and belief.

12/06/2017

Signature of Person Completing the Environmental Assessment Form

Date

The Department may waive a specific information requirement in writing, at the request of the Applicant, during the pre-application review process if the Department determines that specific information is not necessary to review the application.

Enclosure A

Wetland and Stream Delineation Report

Wetland and Stream Delineation Report

Birdsboro Power LLC 216040.01

Borough of Birdsboro; Union, Exeter and Robeson Township, Berks County, Pennsylvania

Prepared for:
Birdsboro Power, LLC
PO Box 314
Birdsboro, PA 19508-2056

November 2016 Revised October 2017 Addended February 2018



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APPENDICES

 $\begin{array}{lll} & Appendix \ A-Wetland \ and \ Stream \ Determination \ Data \ Forms \\ & Appendix \ B-Site \ Photographs \end{array}$

1.0 INTRODUCTION

1.1 GENERAL INFORMATION

This report presents the findings of a wetland and stream delineation study conducted by Dawood Engineering, Inc. (Dawood) on the site of the proposed Birdsboro Power, LLC project. The project area of investigation consists of approximately 277 acres located in the Borough of Birdsboro, Exeter, Union and Robeson Township, Berks County, Pennsylvania (Figure 1).

Dawood conducted the site reconnaissance in July, August, September, and October 2016.

1.2 METHODOLOGY

Dawood identified and delineated potential jurisdictional waters including wetlands and streams (ephemeral, intermittent, and perennial) within the site. The methodology for conducting the wetland and stream delineation work is presented below.

1.2.1 Methodology for Delineating Wetlands

The wetland delineation was based on Dawood's professional judgment and interpretation of the technical criteria presented in the *Corps of Engineers Wetlands Delineation Manual*, *Environmental Laboratory*, 1987 (Manual) and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) Regional Supplement. Wetland boundaries, where present, were delineated using the routine onsite determination method described in the Manual supplemented by *The National Wetland Plant List* (Lichvar 2016) and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service's *Soil Survey Geographic Database* (SSURGO) for Berks County, Pennsylvania map and metadata. Dawood completed the following scope of services to identify and delineate jurisdictional wetland boundaries at the site:

1. Office Data Review: Dawood personnel reviewed the U.S. Geological Survey (USGS) topographic mapping (Figure 1), USDA's SSURGO map (Figure 2), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Figure 3), existing aerial photography, and the hydric soils list from the SSURGO's metadata file. These resources were used to identify potential wetland areas prior to conducting the fieldwork. Other potential jurisdictional water bodies located within the project area, such as streams and ponds, were also identified from these resources.

2. Site Reconnaissance: Dawood performed the wetland delineation using the routine onsite determination method (Environmental Laboratory 1987). First, plant communities present on the site were identified. The dominant plant species within each community were identified and a determination was made on whether hydrophytic (wetland) plants dominated the plant community. Next, a representative test site was located within the plant community and soils were sampled using a spade shovel to determine if hydric soil indicators were present. Lastly, the test site was inspected to determine if indicators of wetland hydrology (inundation, soil saturation, etc.) were present. When a test site was determined to be within a wetland, further testing was performed to locate the wetland/nonwetland boundary and a second test site was typically established outside the wetland boundary to document non-wetland conditions. Data forms were completed to record the vegetation, soils and hydrology observations at each wetland and non-wetland test site and representative photographs were taken (Appendix A and Appendix B, respectively). The boundaries of areas having wetland vegetation, hydric soils, and wetland hydrology were marked in the field with consecutively numbered surveyor's ribbon flags and subsequently georeferenced using a handheld Global Positioning System (GPS) with sub-meter accuracy capability.

1.2.2 Methodology for Delineating Streams

In addition to identifying wetlands, Dawood reviewed the site for streams that would likely be considered jurisdictional by state and or federal regulatory agencies. A weight-of-evidence approach for identifying streams was used and was based on the evaluation of multiple lines of evidence concerning physical and biological indicators of stream hydrology. Dawood used field indicators such as flow, substrate composition, embeddedness, presence/absence of defined bed and banks, origin of hydrologic source, presence/absence of vegetation in the stream channel, and composition and relative abundances of resident benthic macroinvertebrates to classify on-site stream segments into three stream types: ephemeral, intermittent, or perennial. A description of each stream type is provided below.

- <u>Ephemeral Stream</u> Stream reaches lacking flow or benthic macroinvertebrate communities. Ephemeral streams typically flow in direct response to precipitation events and/or snow melt.
- <u>Intermittent Stream</u> Stream reaches containing seasonal flows and possibly containing a benthic macroinvertebrate community comprised of taxa with short aquatic life stages (e.g., midges, blackfly larvae).
- <u>Perennial Stream</u> Stream reaches containing year-round flow dominated by a diverse benthic macroinvertebrate community and containing permanently aquatic taxa or

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those with long aquatic life stages (e.g., freshwater mussels, dobsonflies, mayflies, and stoneflies).

The uppermost limit of a perennial stream was determined at the point where there was a shift in the benthic macroinvertebrate community, from one with a predominance of long-lived taxa to one dominated by short-lived taxa. The uppermost limit of an intermittent stream was determined at the point where there was a loss of flow and/or benthic macroinvertebrate communities. At this point, the break between intermittent and ephemeral was identified and a GPS point was collected. The uppermost limit of an ephemeral stream was determined at the point where the stream lost its defined bed and bank or ordinary high water mark (OHWM) and a predominance of upland vegetation was observed within the channel.

The limit of each stream segment was marked in the field with surveyors flagging and georeferenced with a handheld GPS unit with sub-meter accuracy capabilities.

The physical characteristics of the stream and field observations are summarized on stream determination data forms presented in Appendix A. Photographs of delineated stream segments are presented in Appendix B.

2.0 FINDINGS

2.1 SITE SOILS

A review of the SSURGO map and database for Berks County, Pennsylvania (USDA, 2015), identified fifteen soil mapping units within the project site. The soil mapping units identified within the project area are shown on Figure 2 and general characteristics are summarized in Table 1 below.

TABLE 1 SUMMARY OF ONSITE SOILS

Soil Mapping Unit Name (1)	Soil Mapping Symbol (1)	Drainage Class (1)	Hydric Soil Designation (1)
Abbottstown silt loam, 0 to 3 percent slopes	AbA	Somewhat poorly drained	Hydric Inclusions
Birdsboro silt loam, 3 to 8 percent slopes	BmB	Well drained	Hydric Inclusions
Bowmansville-Knauers silt loams	Во	Poorly drained	Hydric Inclusions
Croton silt loam, occasionally ponded, 0 to 3 percent slopes	CwA	Poorly drained	Hydric
Gibraltar silt loam	Gc	Well drained	Hydric Inclusions
Joanna loam, 3 to 8 percent slopes	JnB	Well drained	Hydric Inclusions
Lamington silt loam, 0 to 3 percent slopes	LfA	Poorly drained	Hydric
Penn channery silt loam, 3 to 8 percent slopes	PeB	Well drained	Hydric
Penn channery silt loam, 8 to 15 percent slopes	PeC	Well drained	Hydric Inclusions
Penn-Klinesville channery silt loams, 8 to 15 percent slopes	PkC	Well drained	Hydric Inclusions
Penn-Klinesville channery silt loams, 15 to 25 percent slopes	PkD	Well drained	Hydric Inclusions
Raritan silt loam, 3 to 8 percent slopes	RaB	Moderately well drained	Hydric Inclusions
Udorthents	Ua	Moderately well drained	Not Hydric
Urban land, 0 to 8 percent slopes	UgB	n/a	Not Hydric
Urban land-Penn complex, 0 to 8 percent slopes	UxB	n/a	Hydric Inclusions

2.2 NATIONAL WETLANDS INVENTORY MAPS

The USFWS NWI map has been prepared based on high altitude infrared aerial photography and limited ground truthing. Wetlands and deep-water habitats are identified on these maps and classified according to the system developed by Cowardin and et. al. (1979).

Six NWI wetlands were identified within the project area on the Birdsboro, PA quadrangle NWI map (Figure 3) and are tabulated below in Table 2.

TABLE 2 SUMMARY OF NWI WETLANDS

NWI Classification	Wetland Type	Associated Property	Field Determination
PSS1/EM5C	Palustrine Scrub-Shrub/ Emergent Wetland	Schuylkill River*	Schuylkill River
R2UBH	Riverine	Schuylkill River*	Schuylkill River
PFO1A	Palustrine Forested Wetland	Birdsboro Slag Products Co, Inc.	Floodplain
PSS1C	Palustrine Scrub-Shrub Wetland	MET ED/Nassau Properties LLC	Wetland ME1/ Stream ME2
PFO1A	Palustrine Forested Wetland	Exeter Township Authority	UPL (EX-SPU2)
PFO1A	Palustrine Forested Wetland	Paul E Rapak	UPL

^{*}Pennsylvania Wild and Scenic River

2.3 SITE PLANT COMMUNITIES

The dominant plant communities present on the site were primarily riparian floodplain/forest and manicured lawns. Dominant plant species within the plant community were identified and the U.S. Army Corps of Engineers (USACE) wetland plant indicator status was determined according *The National Wetland Plant List* (Lichvar 2016). The USACE has established five wetland plant indicator categories, defined as follows:

- (1) Obligate wetland (OBL) Almost always occur in wetlands; rarely in non-wetlands;
- (2) Facultative wetland (FACW) Usually occur wetlands, but occasionally occur in non-wetlands;
- (3) Facultative (FAC) Commonly occur in wetlands and non-wetlands;
- (4) Facultative upland (FACU) Usually occur in non-wetlands, but occasionally occur in wetlands; and
- (5) Upland (UPL) Almost always occur in non-wetlands, rarely in wetlands.

The USACE and the Pennsylvania Department of Environmental Protection (PADEP) consider plants classified as OBL, FACW or FAC to be wetland plants (or hydrophytes).

2.4 SITE HYDROLOGY

Site elevations range from approximately 140 feet above mean sea level to approximately 290 feet above mean sea level. Hydrology within the study area is conveyed to Heisters Creek, Hay Creek, the Schuylkill River, and various unnamed tributaries of the Schuylkill River. Heisters Creek, Schuylkill River, and all Unnamed Tributaries (UNT) to Schuylkill River are designated for use by Warm Water Fishes and Migratory Fishes (WWF, MF) per Chapter 93, Title 25 of the Pennsylvania Code (Chapter 93). Hay Creek is designated for use by Cold Water Fishes and Migratory Fishes (CWF, MF) according to Chapter 93. Additionally, Hay Creek is classified as a wild trout stream (naturally reproducing) and stocked trout stream.

2.5 DELINEATED WETLANDS

Eight (8) palustrine emergent (PEM) wetland systems, one (1) palustrine scrub-shrub (PSS) wetland, and one (1) palustrine forested (PFO) wetland were identified and delineated within the area of investigation. The size, cover-type based on the Cowardin classification system, and corresponding sample points and photograph numbers are provided below in Table 3. Wetland determination data forms are provided in Appendix A and wetland photographs are provided in Appendix B.

Exceptional value (EV) wetlands deserve special protection and are classified within Chapter 105 Section 17 of the PA Code (§ 105.17). Table 3 includes columns indicating if a wetland is considered to have EV status and under which § 105.17 characteristic it receives such classification. According to Section 17, EV wetlands have one or more of the following characteristics:

- (i) Wetlands which serve as habitat for fauna or flora listed as "threatened" or "endangered" under the Endangered Species Act of 1973 (7 U.S.C.A. § 136; 16 U.S.C.A. § \$4601-9, 460k-1, 668dd, 715i, 715a, 1362, 1371, 1372, 1402 and 1531—1543), the Wild Resource Conservation Act (32 P. S. § \$5301—5314), 30 Pa.C.S. (relating to the Fish and Boat Code) or 34 Pa.C.S. (relating to the Game and Wildlife Code).
- (ii) Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified under subparagraph (i) and that maintain the habitat of the threatened or endangered species within the wetland identified under subparagraph (i).
- (iii) Wetlands that are located in or along the floodplain of the reach of a wild trout stream or waters listed as exceptional value under Chapter 93 (relating to water quality standards) and the floodplain of streams tributary thereto, or wetlands within the corridor of a watercourse or body of water that has been designated as a National wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 (16 U.S.C.A. § § 1271—1287) or designated as wild or scenic under the Pennsylvania Scenic Rivers Act (32 P. S. § § 820.21—820.29).
- (iv) Wetlands located along an existing public or private drinking water supply, including both surface water and groundwater sources, that maintain the quality or quantity of the drinking water supply.
- (v) Wetlands located in areas designated by the Department as "natural" or "wild" areas within State forest or park lands, wetlands located in areas designated as Federal wilderness areas under the Wilderness Act (16 U.S.C.A. § § 1131—1136) or the Federal Eastern Wilderness Act of 1975 (16 U.S.C.A. § 1132) or wetlands located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935 (16 U.S.C.A. § § 461—467)

TABLE 3 SUMMARY OF WETLANDS

Wetland Name	Sample Point	Wetland Classification ¹	Total Delineated Wetland Acreage	EV Status	§ 105.17 EV Characteristic	Associated Photograph Number(s)
MB2	MB2-SPW	PEM	0.05	No	ı	5
WN1	WN1-SPW	PEM	0.01	No	1	13
ARK7	ARK7-SPW	PEM	0.79	No	1	15
ARK1	ARK1-SPW	PEM	0.01	No	-	16
ARK4	ARK4-SPW	PFO	0.13	No	1	19
ME1	ME1-SPW	PEM	0.31	No	-	22, 25
LI1	LI1-SPW	PSS	0.10	No	-	28
EX3	EX3-SPW	PEM	0.12	No	-	31
FI1	FI1-SPW	PEM	0.04	No	-	32
BR2	BR2-SPW	PEM	0.05	No	-	36

2.6 DELINEATED STREAMS

In addition to identifying wetlands within the site boundary, Dawood identified twenty-eight (28) streams within the AOI that may be considered "jurisdictional" by the USACE.

The stream determination data forms are provided in Appendix A and stream photographs are provided in Appendix B. The stream name, classification, and length are provided in Table 4 below.

TABLE 4 SUMMARY OF STREAMS

Watercourse Name	Waters Classification	Chapter 93 Designation	Delineated Stream Length (feet)	Associated Photograph Number(s)
AR5	Ephemeral	CWF, MF	134	1
Hay Creek	Perennial	CWF, MF	1,282	2
Schuylkill River	Perennial	WWF, MF	675	3
MB1	Perennial	WWF, MF	1,275	4
MB3	Ephemeral	WWF, MF	186	6
FR1	Perennial	WWF, MF	200	7
MB4	Intermittent	WWF, MF	1,542	8
MB5	Ephemeral	WWF, MF	25	9
MB6	Ephemeral	WWF, MF	6	10
MB7	Intermittent	WWF, MF	320	11
MB8	Intermittent	WWF, MF	211	12
WN2	Ephemeral	WWF, MF	54	14
WN3	Ephemeral	WWF, MF	30	-
ARK2	Intermittent	WWF, MF	399	17
ARK3	Intermittent	WWF, MF	381	18
ARK5	Intermittent	WWF, MF	44	20
ARK6	Intermittent	WWF, MF	202	21
ME2	Perennial	WWF, MF	697	22, 23
ME3	Ephemeral	WWF, MF	52	24
NA2	Intermittent	WWF, MF	40	26
NA3	Ephemeral	WWF, MF	48	27
EX1 (Heisters Creek)	Perennial	WWF, MF	1,162	29
EX2	Ephemeral	WWF, MF	163	30
EX4	Ephemeral	WWF, MF	234	37
PA3	Ephemeral	WWF, MF	147	33
PA2	Intermittent	WWF, MF	634	34
BR1	Ephemeral	WWF, MF	226	35
BR3	Ephemeral	WWF, MF	70	38

2.7 OTHER DELINEATED WATERS

No other potentially jurisdictional waters were identified within the project AOI.

3.0 REGULATORY CONSIDERATIONS

3.1 MEETINGS WITH REGULATORY AGENCIES

To date, there have been no meetings between Dawood, PADEP, or USACE regarding delineated limits of jurisdictional waters identified on the project site.

3.2 REGULATORY ISSUES

The USACE and PADEP regulate discharges of fill and obstructions/encroachments within or across jurisdictional wetlands and streams. Discharges of dredged or fill material into waters of the United States, including non-isolated wetlands, require permits from the USACE under the provisions of Section 404 of the Clean Water Act (CWA). A Water Quality Certification must also be obtained from the PADEP, in accordance with Section 401 of the CWA.

Obstructions and encroachments in regulated waters of the Commonwealth, including wetlands, are regulated on the state level by PADEP. Before commencing activities in a stream, river, floodway, lake, pond or wetland, the appropriate permit must be secured. Pennsylvania regulates impacts to wetlands and water bodies under the provisions of 25 PA Code Chapter – 105 Dam Safety and Waterway Management.

4.0 CONCLUSIONS

Ten (10) wetland systems and twenty-eight (28) watercourses were identified within the area of investigation. Dawood personnel flagged and subsequently georeferenced aquatic resource boundaries using a survey grade GPS unit with sub-centimeter accuracy capability. The boundaries of all potential jurisdictional waters are shown on Figure 4.

5.0 REFERENCES

- Cowardin, L. M., V. Carter, and F. C. Golet. 1979. *Classification of Wetlands and Deep Water Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service. Washington D. C. FWS/OBS-79/31.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterway Experiment Station, Vicksburg, Mississippi.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X
- Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic (SSURGO) Database for Berks County, Pennsylvania. Survey Area Version: 13; Survey Area Version Date: 09/19/2016.
- Title 25, Pennsylvania Code, Section 105. Dam Safety and Waterway Management.
- Title 33, Code of Federal Regulations, Section 404. Clean Water Act.
- U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0. ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

6.0 FEBRUARY 2018 ADDENDUM

This addendum was prepared to address the Pennsylvania Department of Environmental Protection (PADEP)'s elevated review comment #5, as described in correspondence dated January 30, 2018. This comment stated: "Provide clarification whether a wetland presence/absence determination was conducted for the proposed ring bus station. Provide documentation and supporting evidence for the determination."

WETLAND DELINEATION PROCEDURE FOR THE RING BUS STATION PARCEL

Figure 4 shows the Area of Investigation (AOI) for the parcel where the proposed ring bus station is proposed to be constructed. An on-site field investigation for water resources was conducted on this site in August 2016. The proposed substation is underlain by Birdsboro silt loam (BmB), which is listed on the PA Hydric Soils list for Berks County. One sample point was formally documented within this soil series unit, BR2-SPU. Sample point BR2-SPU was located on the boundary between the actively managed farmland (cultivating *Glycine max* at the time of investigation) and a more successional herbaceous meadow. The sampling point failed to meet any hydrology, hydrophytic vegetation, or hydric soil indicators. Dominant vegetation was FACU-UPL and soils were documented as 10YR 4/4 from 0-10" and 7.5YR 5/4 and 7.5YR 4/4 from 10-12", without any redoximorphic features.

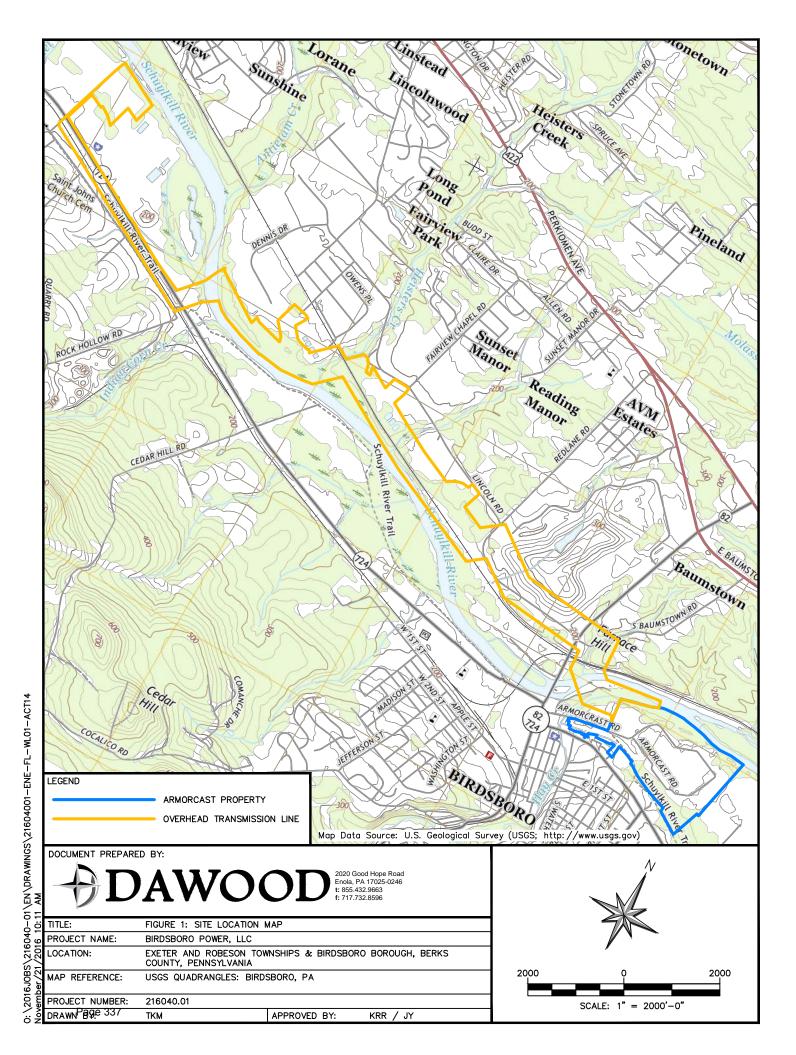
The substation is proposed predominantly on land currently used for agriculture. Per the EMP Regional Manual (Manual), managed plant communities are naturally problematic and can affect the hydrophytic vegetation determination on-site. Per the Manual, the wetland assessment for the cultivated areas on the site was conducted by performing the following recommended procedures:

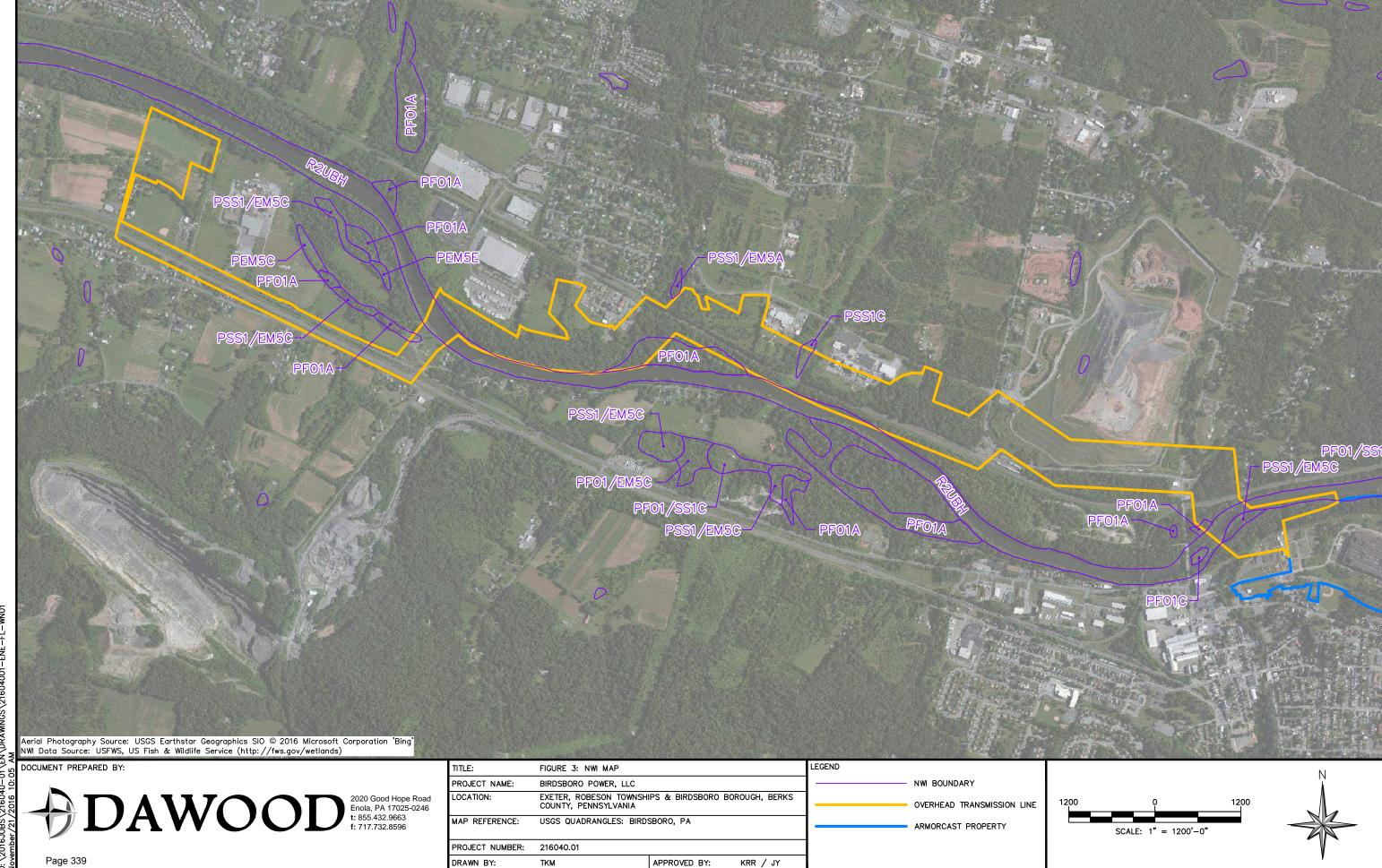
- Examine the vegetation on a nearby, unmanaged reference site having similar soils and hydrologic conditions. Assume that the same plant community would exist on the managed site in the absence of human alteration.
 - Sample point BR2-SPU was documented at the boundary of one managed soybean field and an herbaceous area in a more successional state.
- For recently cleared or tilled areas (not planted or seeded), leave representative areas unmanaged for at least one growing season with normal rainfall and reevaluate the vegetation.
 - o Implementation of this procedure was not feasible.
- If management was initiated recently, use offsite data sources such as aerial photography, NWI maps, and interviews with the land owner and other persons familiar with the area to determine what plant community was present on the site before the management occurred.
 - The site appears to have been managed under an agricultural land use since at least 1937 based on aerial photography.

- If the unmanaged vegetation condition cannot be determined, make the wetland determination based on indicators of hydric soil and wetland hydrology.
 - Sample point BR2-SPU was taken adjacent to an area observed to contain hydrology, hydric soil, and hydrophytic vegetation indicators. Multiple soil probes in or adjacent to the area where the proposed substation is to be constructed were observed to be similar to those observed at BR2-SPU. However, these were not formally documented in the data set as sampling points.
 - O Hydrology indicators were not observed at or in the vicinity of the proposed substation location. One hydrology indicator, Indicator D1 (stunted or stressed plants), is typically observed in agricultural fields and managed vegetative communities. Individuals of the managed species growing in a potential wetland are observed to be of smaller stature, less vigorous, or stressed compared with individuals growing in a nearby drier landscape. No soybean crops were observed to be stunted or stressed, as compared to other cultivated areas, during the field investigation.

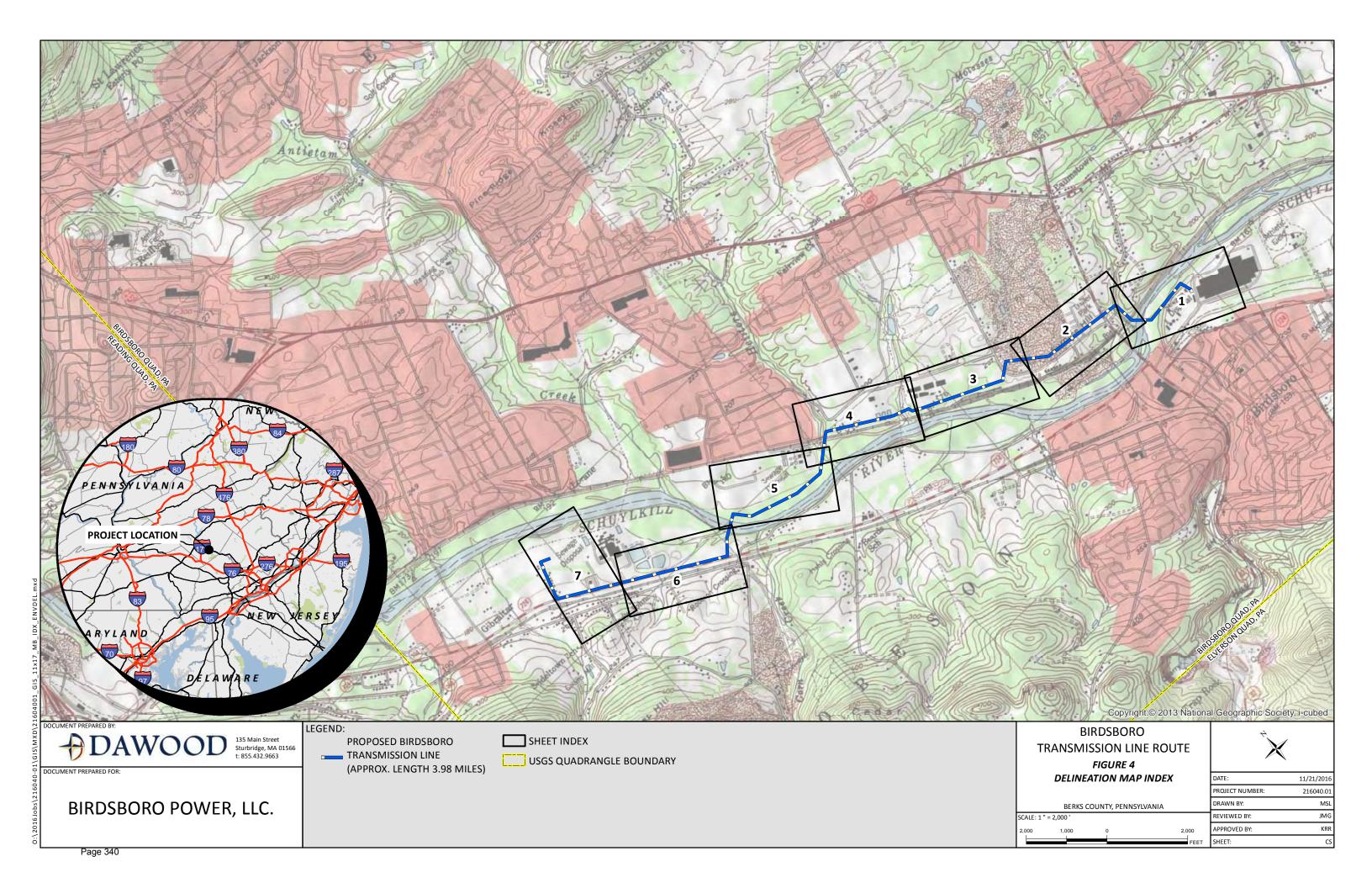
Based on standard implementation of these procedures and professional judgement, the area of the proposed substation was determined to possess non-wetland characteristics, even though mapped as a hydric soil.

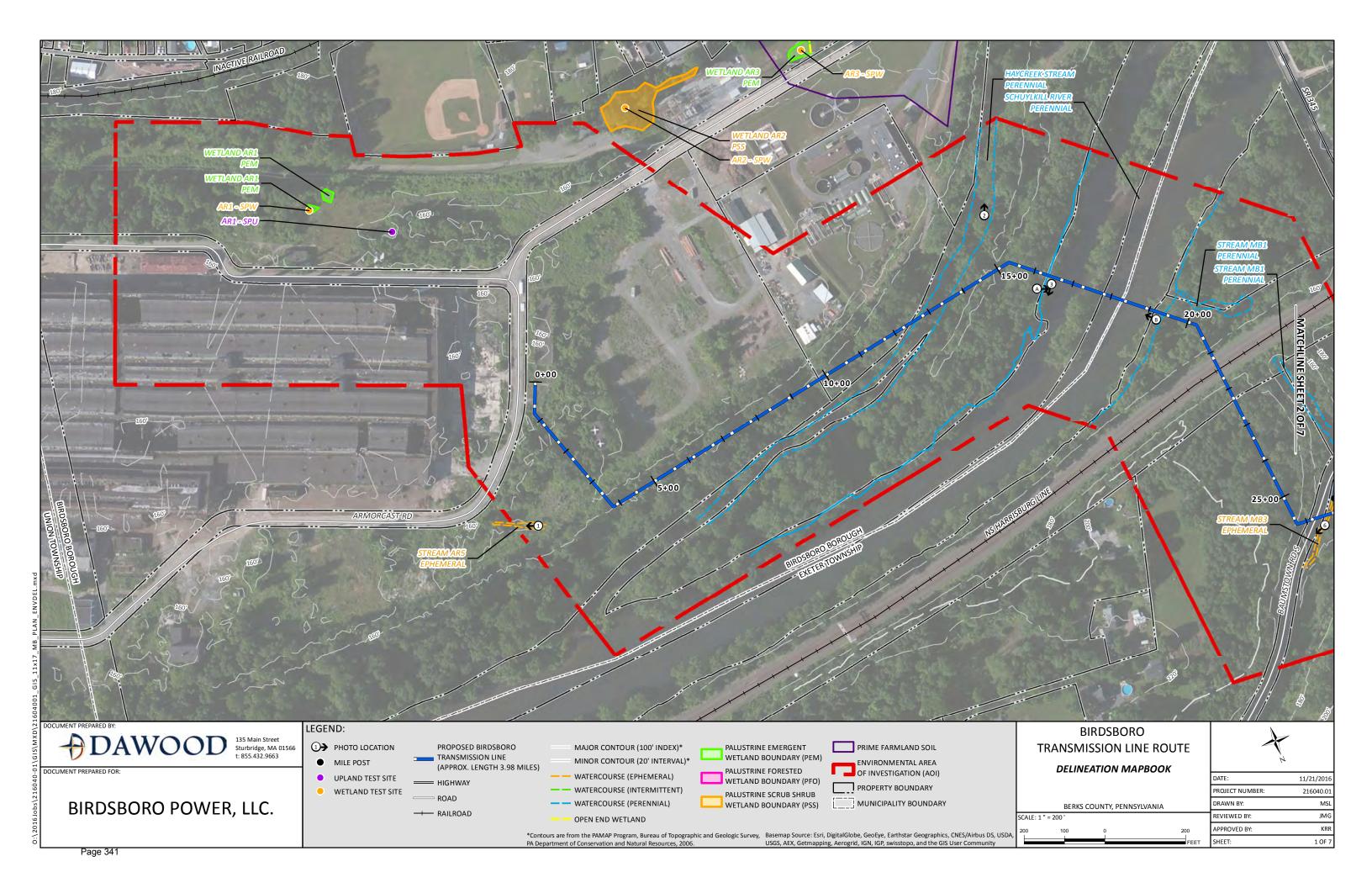
FIGURES	

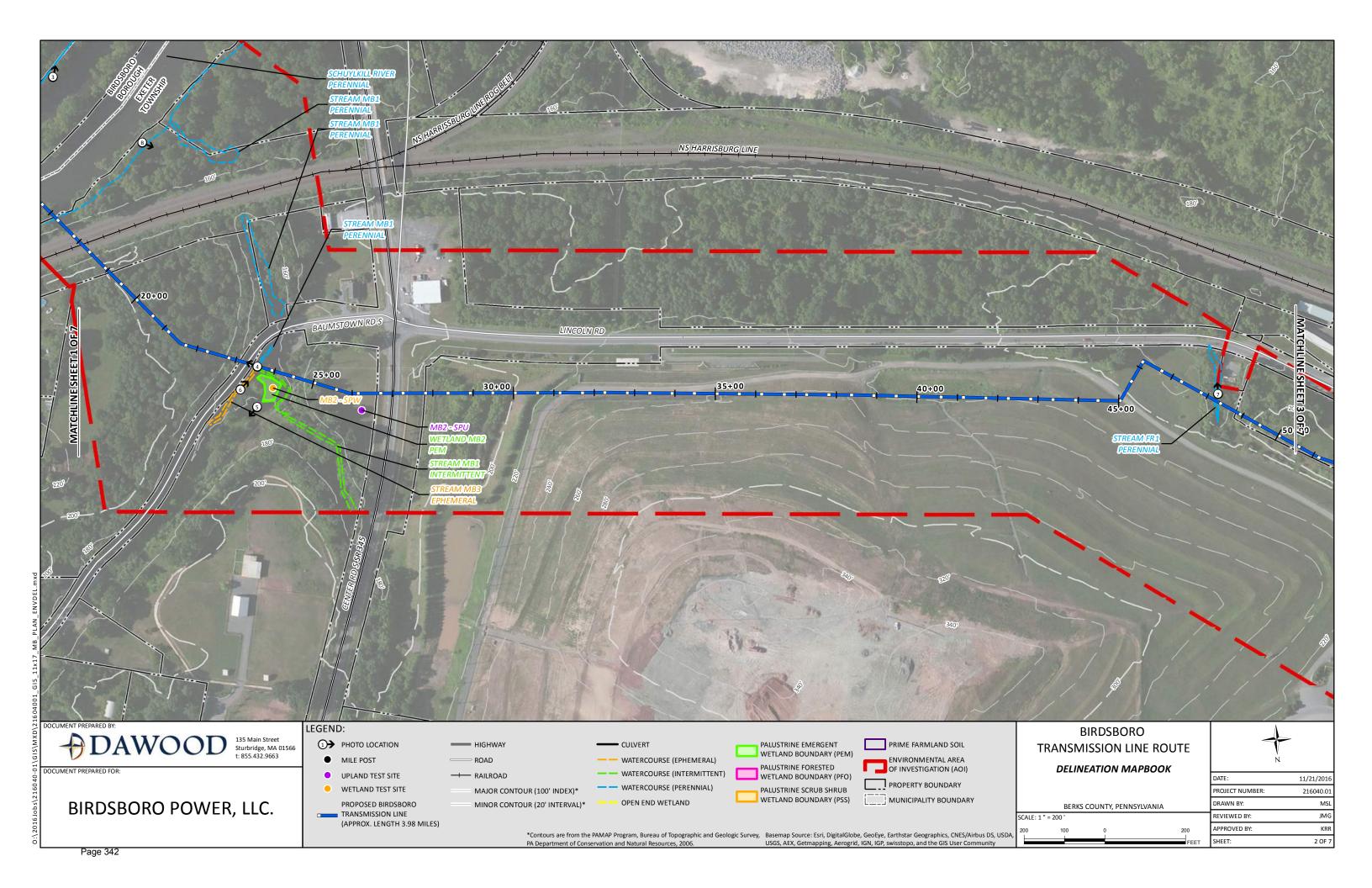


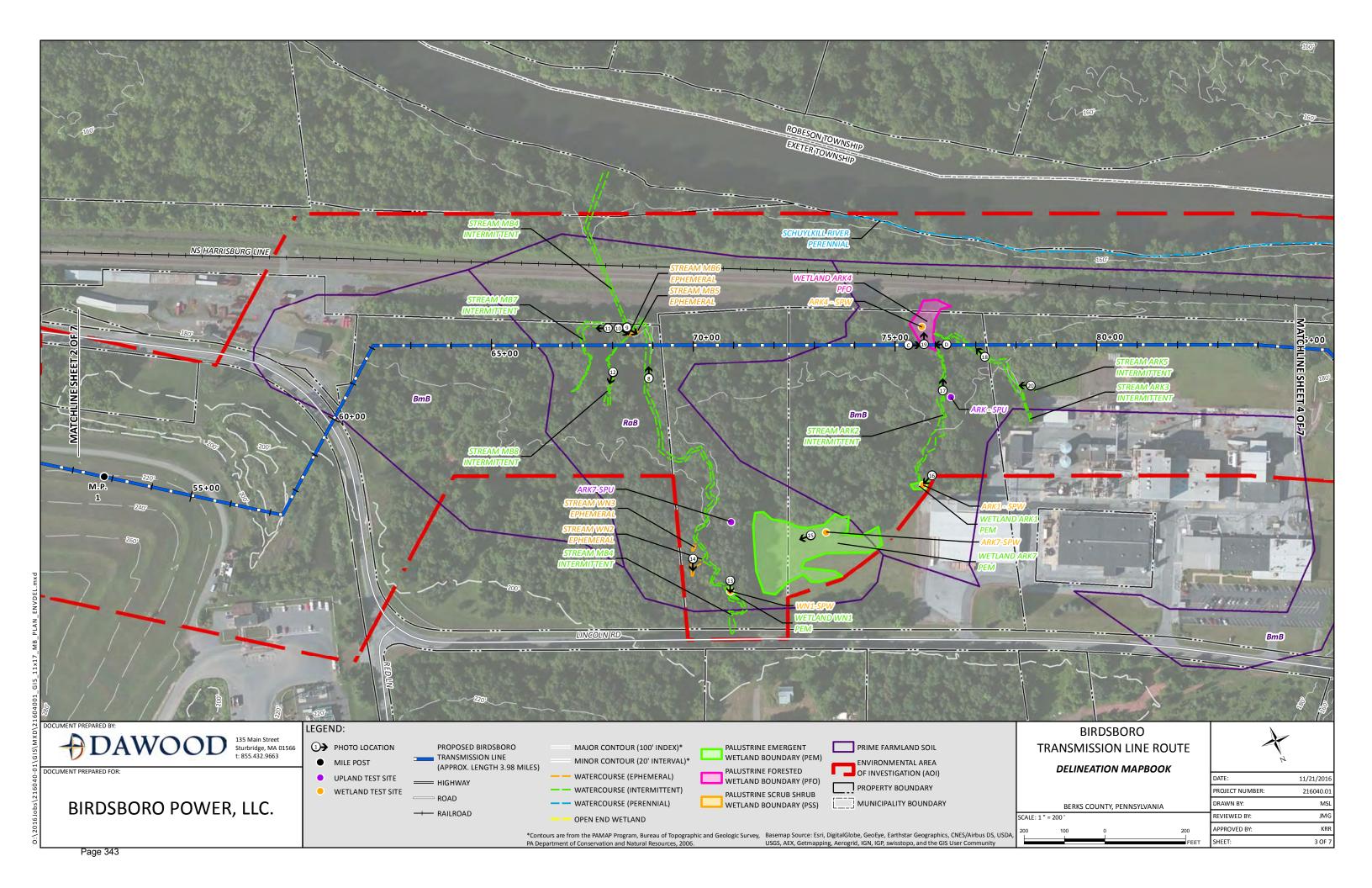


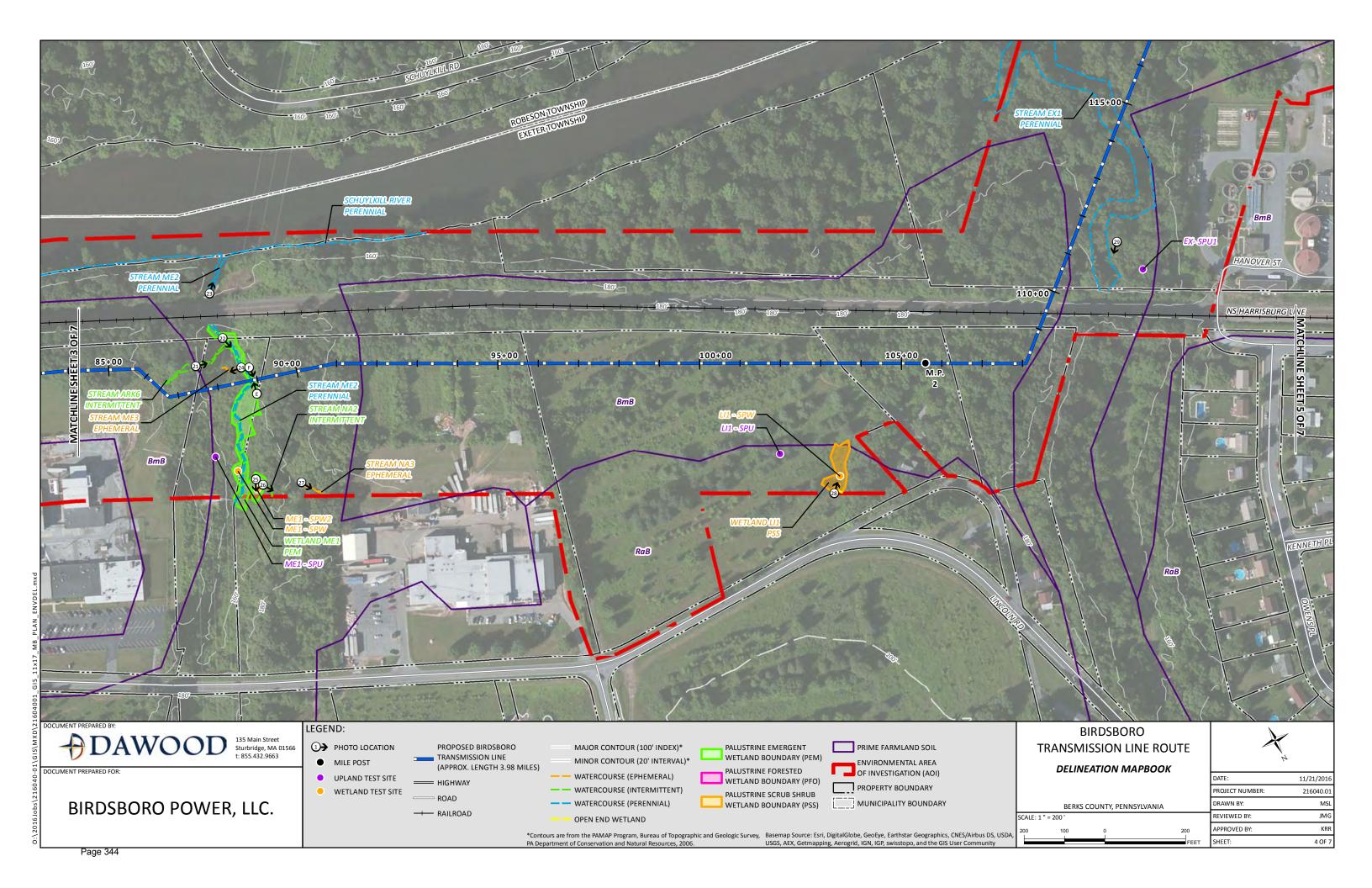
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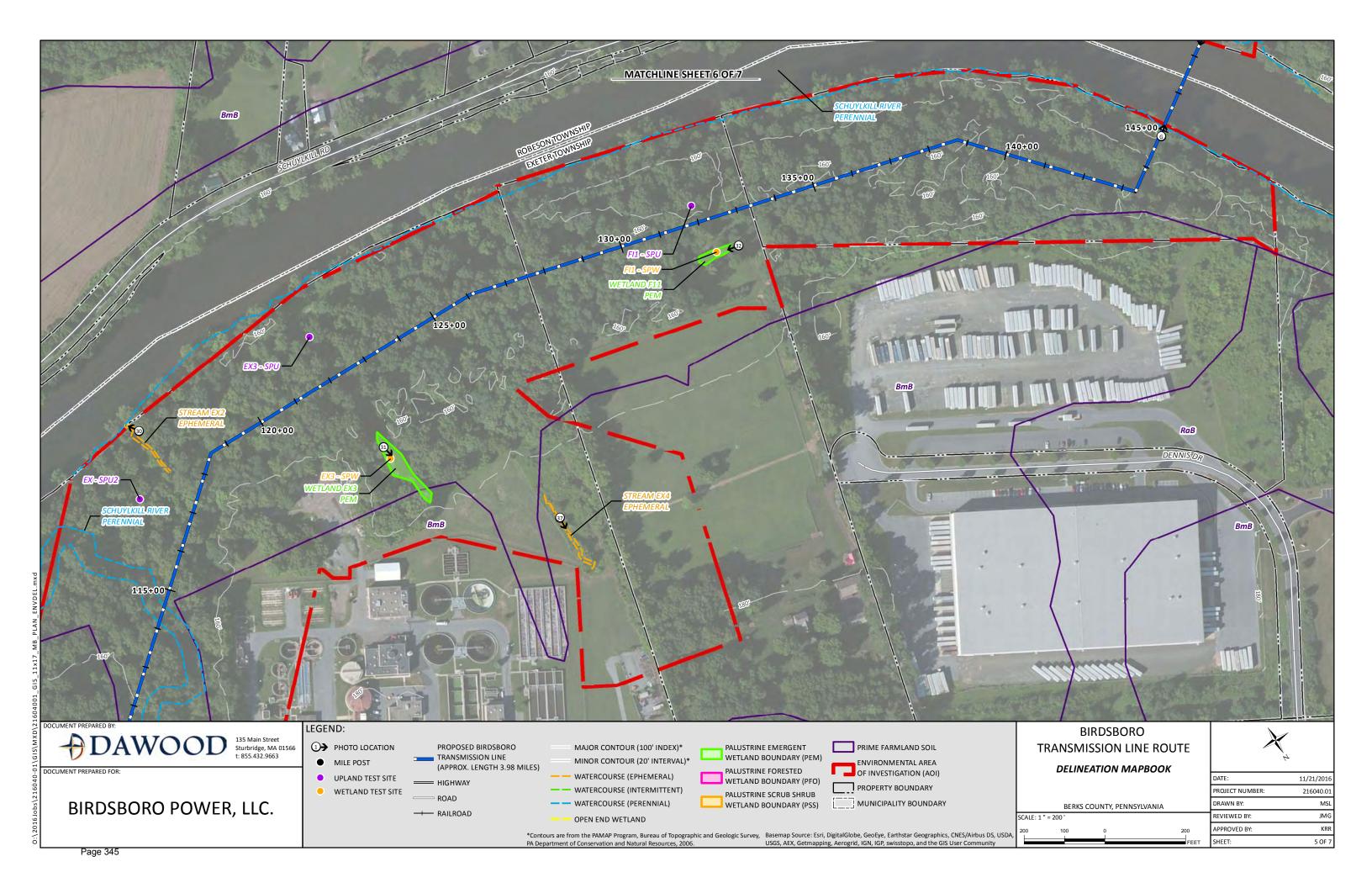


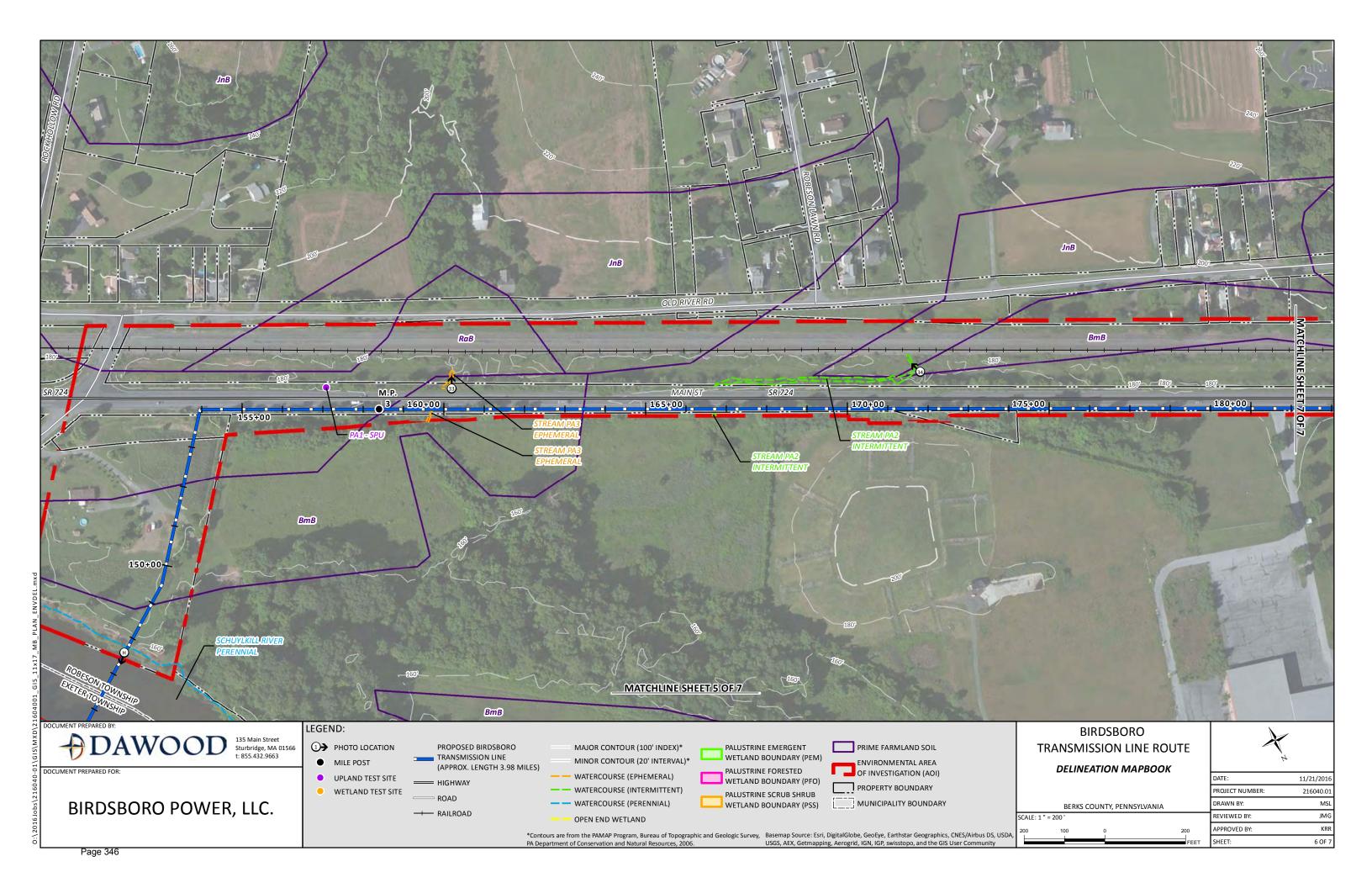


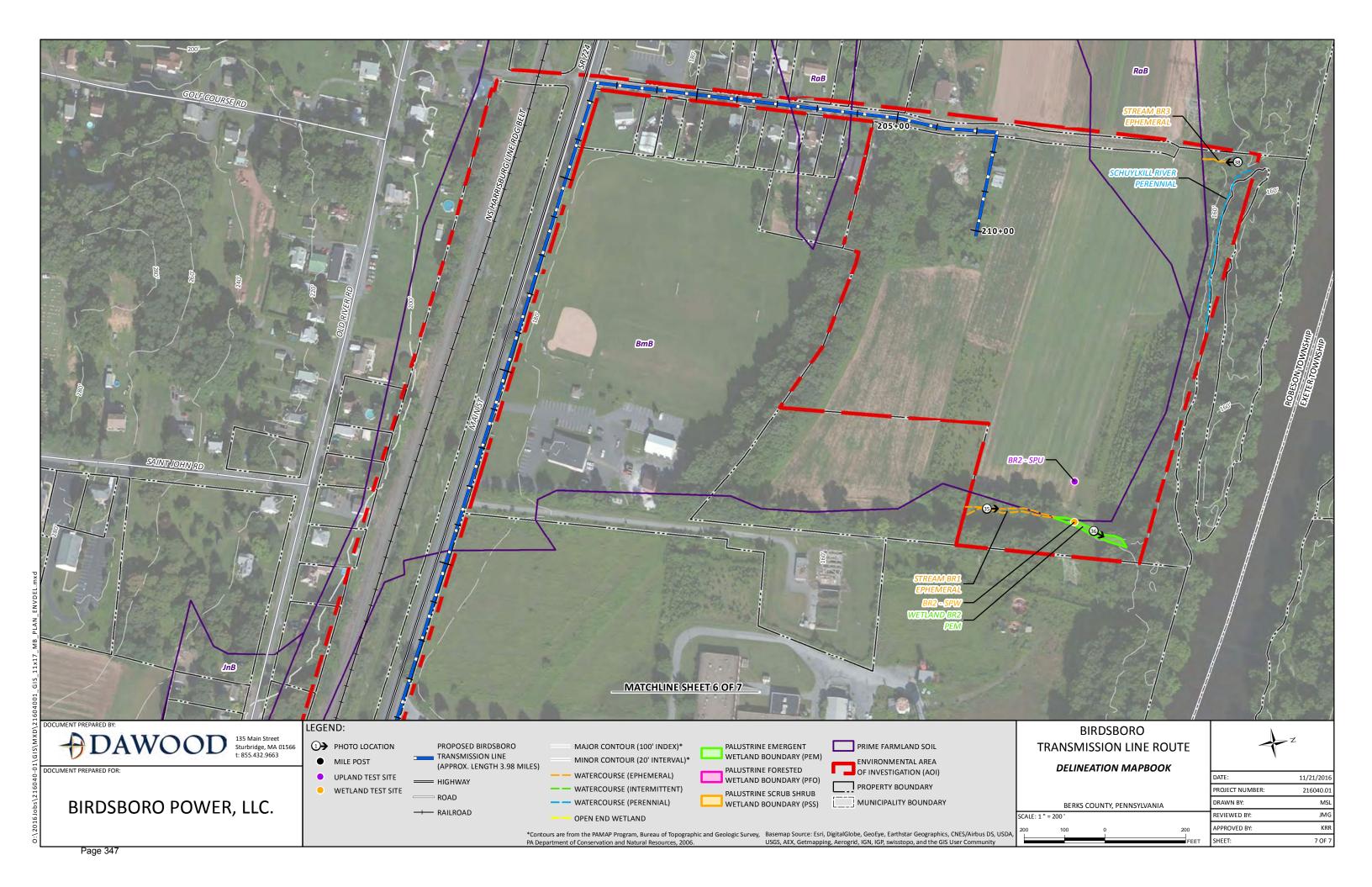












APPENDIX A	
FIELD DATA FORMS	

Project/Site: Birdsboro Power LLC		City/County: Birdsboro Borou	gh/Berks Co. Sam	pling Date: 12-Jul-16
Applicant/Owner: Birdsboro Power, I	LLC	State: PA	Sampling F	Point: AR1-SPW
Investigator(s): KR, JY		Section, Township, Range: S	т	R
Landform (hillslope, terrace, etc.):	Undulating	Local relief (concave, convex,	none): concave	Slope:/
Subregion (LRR or MLRA): MLRA	148 in LRR S Lat.:	40.267287 Lo	ng.: -75.799950	Datum: NAD 83
Soil Map Unit Name: Udorthents (L		10.207207	NWI classification	
Are climatic/hydrologic conditions of		ar? Yes • No O (If no	o, explain in Remarks.)	
				nt? Yes • No O
			l Circumstances" prese	
Are Vegetation, Soil Summary of Findings - At			explain any answers in	
Hydrophytic Vegetation Present?	Yes No		, , ,	<u>, , , , , , , , , , , , , , , , , , , </u>
Hydric Soil Present?	Yes ● No ○	Is the Sampled Area		
•	Yes ● No ○	within a Wetland?	Yes ● No ○	
Wetland Hydrology Present? Remarks:	103 0 140 0			
Hydrology				
Wetland Hydrology Indicators:			Secondary Indicators (m	
Primary Indicators (minimum of or		(D14)	Surface Soil Cracks (•
Surface Water (A1) High Water Table (A2)	True Aquatic Plants Hydrogen Sulfide C		☐ Sparsely Vegetated (☐ Drainage Patterns (E	Concave Surface (B8)
Saturation (A3)	3 3	res along Living Roots (C3)	Moss Trim Lines (B1	
Water Marks (B1)	Presence of Reduce		Dry Season Water Ta	•
Sediment Deposits (B2)		tion in Tilled Soils (C6)	Crayfish Burrows (C8	
Drift deposits (B3)	☐ Thin Muck Surface	(C7)	Saturation Visible on	Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in R	emarks)	Stunted or Stressed	Plants (D1)
☐ Iron Deposits (B5)	(5-5)		✓ Geomorphic Position	• •
Inundation Visible on Aerial Imager	ry (B7)		Shallow Aquitard (D3	
Water-Stained Leaves (B9) Aquatic Fauna (B13)			✓ Microtopographic Re✓ FAC-neutral Test (D!	• •
Field Observations:			FAC-neutral rest (D:	5)
Surface Water Present? Yes	No Depth (inches):			
Water Table Present? Yes				
Saturation Present? (includes capillary frings) Yes		Wetland Hyd	rology Present? Ye	es No
(includes capillally frifige)				
Describe Recorded Data (stream ga	auge, monitoring well, aerial photo	s, previous inspections), if ava	ilable:	
Domorko				
Remarks:				

		-Species?	<u> </u>
	Absolute	Rel.Strat. Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Cover Status	Number of Dominant Species
1	0	0.0%	That are OBL, FACW, or FAC: (A)
2	0	0.0%	
3.		0.0%	Total Number of Dominant Species Across All Strata: 2 (B)
4		0.0%	Species Across All Strata.
5		0.0%	Percent of dominant Species
		0.0%	That Are OBL, FACW, or FAC:100.0% (A/B)
6		0.0%	Barrelone Followed by the
7			Prevalence Index worksheet:
8		0.0%	Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:) =	= Total Cover	0BL speci es 10 x 1 = 10
	, 	0.0%	FACW species60
1		0.0%	FAC speci es <u>35</u> x 3 = <u>105</u>
2			FACU species0 x 4 =0
3			UPL species $0 \times 5 = 0$
4			' '
5	0		Column Totals: <u>105</u> (A) <u>235</u> (B)
6	0		Prevalence Index = B/A =2.238
7	0	0.0%	Hydrophytic Vegetation Indicators:
8		0.0%	Rapid Test for Hydrophytic Vegetation
9.		0.0%	
10		0.0%	✓ Dominance Test is > 50%
0		= Total Cover	V Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)			Morphological Adaptations ¹ (Provide supporting
1			data in Remarks or on a separate sheet)
2	0	0.0%	☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3	0	0.0%	1 Indicators of hydric soil and wetland hydrology must
4		0.0%	be present, unless disturbed or problematic.
5.		0.0%	Definition of Vegetation Strata:
6		0.0%	Four Vegetation Strata:
		0.0%	Tree stratum – Consists of woody plants, excluding vines, 3 in.
7			(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')		= Total Cover	regardless of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Juncus tenuis	35	✓ 33.3% FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Phragmites australis	35	✓ 33.3% FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Verbena hastata	15	14.3% FACW	regardless of size, and all other plants less than 3.28 ft tall.
4 Carex vulpinoidea	10	9.5% OBL	Woody vines – Consists of all woody vines greater than 3.28 ft
5. Scirpus cyperinus	10	9.5% FACW	in height.
6.		0.0%	
		0.0%	Five Vegetation Strata:
7		0.0%	Tree - Woody plants, excluding woody vines, approximately 20
8			ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9			Sapling stratum – Consists of woody plants, excluding woody
10			vines, approximately 20 ft (6 m) or more in height and less
l1	0	0.0%	than 3 in. (7.6 cm) DBH.
2	0	0.0%	Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	105=	= Total Cover	Herb stratum – Consists of all herbaceous (non-woody) plants,
	0	0.0%	including herbaceous vines, regardless of size, and woody
1			species, except woody vines, less than approximately 3 ft (1
2			m) in height.
3		0.0%	Woody vines – Consists of all woody vines, regardless of
4		0.0%	height.
5	_		Hydronhytic
		0.0%	Hydrophytic Vegetation
n			
6	0	= Total Cover	Present? Yes No U

Soil Sampling Point: AR1-SPW

Types: Co-Committation. D-Depletion. RM-Reduced Matrix, CS = Covered or Coaled Sand Grains PL-Pore Lining, M-Molirix Mydric Soil Indicators: Polymeric Soil Coast Paris (A3) Polymeric Soil Indicators Polymeric Matrix (A3) Dank Surface (S7) (MLRA 117, 148) Hospital Matrix (A3) Dank Surface (S8) (MLRA 117, 148) Polymeric Matrix (A3) Polymeric Matrix (A3	Profile Descr	iption: (De	escribe to	the depth	needed to documen	t the indic	cator or co	nfirm the a	absence of indicators.)				
1 Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains 2-Location: PL=Pore Lining. M=Matrix Hydric Soil Indicators: Histosol (A1)													
Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains 2-Location: PL=Pore Lining, M=Matrix					Color (moist)	%	Type	Loc ²		Remarks			
1 Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains 2 Location: PL=Pore Lining, M=Matrix Hydric Soil Indicators:	0-10	7.5YR	4/3			_			Silt Loam	_			
Hydric Soil Indicators:		10YR	5/8	40									
Hydric Soil Indicators:													
Hydric Soil Indicators:													
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators: Histosol (A1)			_										
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators: Histosol (A1)													
Hydric Soil Indicators:													
Histosol (A1)	¹ Type: C=Con	centration.	D=Depletio	n. RM=Red	uced Matrix, CS=Cove	red or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=	Matrix			
Histic Epipedon (A2)			:						Indicators for Prob	olematic Hydric Soils ³ :			
Histic Epipedon (A2)		•				` '			2 cm Muck (A10	0) (MLRA 147)			
Black Histic (A3)													
Stratified Layers (A5)								48)					
□ 2 cm Muck (A10) (LRR N) □ Redox Dark Surface (F6) □ Very Shallow Dark Surface (TF12) □ Depleted Below Dark Surface (A11) □ Depleted Dark Surface (F7) □ Other (Explain in Remarks) □ Other)						
Depleted Below Dark Surface (A11) □ Depleted Dark Surface (F7) □ Thick Dark Surface (A12) □ Sandy Muck Mineral (S1) (LRR N, MLRA 136) □ Sandy Gleyed Matrix (S4) □ Sandy Redox (S5) □ Piedmont Floodplain Soils (F19) (MLRA 148) □ Stripped Matrix (S6) □ Red Parent Material (F21) (MLRA 127, 147) Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,								(MLRA 136, 147)					
Thick Dark Surface (A12) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 147, 148) Sandy Muck Mineral (S1) (LRR N, MLRA 136) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,									☐ Very Shallow Dark Surface (TF12)				
Sandy Muck Mineral (S1) (LRR N, MLRA 136) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Stripped Matrix (S6) Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,									✓ Other (Explain i	in Remarks)			
MLRA 147, 148) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,							(E12) (LDD I	.1					
Sandy Gleyed Matrix (S4) Sandy Redox (S5) Seripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) □ Piedmont Floodplain Soils (F19) (MLRA 148) □ Red Parent Material (F21) (MLRA 127, 147) □ Restrictive Layer (if observed): □ Type: _rock □ Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,	☐ Sandy Mu	ick Mineral (7 148)	(S1) (LRR N	١,		se wasses	(F12) (LRR I	ν,					
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: _rock _ Depth (inches): _10" Hydric Soil Present? Yes No No No No No No No No No N			(\$4)		Umbric Surfac	ce (F13) (MI	LRA 136, 12	2)					
Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,			(34)						wetland hydrology must be present,				
Restrictive Layer (if observed): Type: _rock Depth (inches): _10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,													
Type: _rock		(00)			Red Talent W	atorial (121	, (WEIGT 12)	, , , , ,	urioss.	distance of problematic.			
Depth (inches): 10" Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,	Restrictive L	ayer (if ob	served):										
Remarks: Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,	Type: <u>rr</u>	nck							Hydric Soil Brocont?	Vac 🔍 Na 🔾			
Soil mixing was likely a result of previous disturbance and soils were considered naturally problematic due to red parent material soils; therefore,	Depth (inc	hes): <u>10''</u>							Hydric Soil Present?	Yes S No C			
	Remarks:												

Project/Site: Birdsboro Power LLC		City/County: Birdsboro Borough	h/Berks Co. Sampling Date: 12-Jul-16
Applicant/Owner: Birdsboro Power,	LLC	State: PA	Sampling Point: AR1-SPU
Investigator(s): KR, JY		Section, Township, Range: S	T R
Landform (hillslope, terrace, etc.):	Undulating	Local relief (concave, convex, no	one): convex Slope: 0.0% / 0.0
Subregion (LRR or MLRA): MLRA	148 in LRR S Lat.:	40.267634 Lon	g.: -75.800559
Soil Map Unit Name: Udorthents ((Ua)		NWI classification: UPL
Are climatic/hydrologic conditions o	on the site typical for this time of v	ear? Yes • No O (If no.	explain in Remarks.)
Are Vegetation, Soil			Circumstances" present? Yes No
Are Vegetation . , Soil .	, or Hydrology		explain any answers in Remarks.)
Summary of Findings - A	ttach site map showing s	sampling point locations	s, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes O No •		
Hydric Soil Present?	Yes O No 💿	Is the Sampled Area	Yes ○ No ●
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?	162 0 110 0
Remarks:			
Ü	s not considered to be applicable.	Soils were considered naturally p	problematic due to red parent material soils.
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
	one required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	☐ True Aquatic Plant	• •	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide	, ,	Drainage Patterns (B10)
Saturation (A3) Water Marks (B1)	Uxidized Rhizosph Presence of Reduc	eres along Living Roots (C3)	Moss Trim Lines (B16) Dry Season Water Table (C2)
Sediment Deposits (B2)		ction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surface	• •	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in F	• •	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	_	•	Geomorphic Position (D2)
Inundation Visible on Aerial Image	ery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)			FAC-neutral Test (D5)
Field Observations: Surface Water Present? Yes	No Depth (inches):		
Water Table Present? Yes			
		Wetland Hydro	ology Present? Yes O No 💿
(includes capillary fringe) Yes	No Depth (inches):		
Describe Recorded Data (stream g	gauge, monitoring well, aerial photo	os, previous inspections), if availa	able:
_			
Remarks:			

			minant		Sampling Point: <u>AR1-SPU</u>
	Absolute % Cover	Re		Indicator Status	Dominance Test worksheet:
1. Salix nigra	40	v _	66.7%	OBL	Number of Dominant Species That are OBL, FACW, or FAC: (A)
2. Platanus occidentalis	20	_	33.3%	FACW	Total Number of Deminant
3	0		0.0%		Total Number of Dominant Species Across All Strata: 5 (B)
4			0.0%		
5	0		0.0%		Percent of dominant Species That Are OBL_FACW_or_FAC: 40.0% (A/B)
6	_		0.0%		That Are OBL, FACW, or FAC: 40.0% (A/B)
7	0		0.0%		Prevalence Index worksheet:
8	0		0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:	60	= To	tal Cover		0BL speci es <u>40</u> x 1 = <u>40</u>
	_		0.0%		FACW species
1		П-	0.0%		FAC speci es x 3 = 0
			0.0%		FACU species 105 x 4 = 420
3			0.0%		UPL speci es $0 \times 5 = 0$
4		H-	0.0%		Column Totals: 165 (A) 500 (B)
5		H-	0.0%		(1)
6		H-			Prevalence Index = B/A = 3.030
7		Η-	0.0%		Hydrophytic Vegetation Indicators:
8		H-	0.0%		Rapid Test for Hydrophytic Vegetation
9		Η-	0.0%		☐ Dominance Test is > 50%
10		Ш_	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')	0	= To	tal Cover		$igcap Morphological Adaptations ^1 (Provide supporting$
1. Lonicera morrowii	35	✓ _	100.0%	FACU	data in Remarks or on a separate sheet)
2	0		0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3	0		0.0%		¹ Indicators of hydric soil and wetland hydrology must
4			0.0%		be present, unless disturbed or problematic.
5			0.0%		Definition of Vegetation Strata:
6.			0.0%		Four Vegetation Strata:
7	0		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
Herb Stratum (Plot size: _5')	35	= To	tal Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	25	~	35.7%	FACU	Sapling/shrub stratum – Consists of woody plants, excluding
1. Alliaria petiolata	25		35.7%	FACU	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Ageratina altissima	10		14.3%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Parthenocissus quinquefolia	10	<u> </u>	14.3%		Woody vines – Consists of all woody vines greater than 3.28 ft
4. Phytolacca americana	0	П-	0.0%	TACO	in height.
5			0.0%		
6			0.0%		Five Vegetation Strata:
7		H-	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8					ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		Η-	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10		Η-	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
11		Η-	0.0%		Shrub stratum – Consists of woody plants, excluding woody
12			0.0% tal Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	70	= 10	tai Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0	$\sqcup_{_}$	0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0		0.0%		m) in height.
3	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4	0		0.0%		height.
5	0		0.0%		Hydrophytic
6	0		0.0%		Hydrophytic Vegetation
	0	= To	tal Cove		Present? Yes No •
Remarks: (Include photo numbers here or on a separate she	et.)				ı
	<i>,</i>				

Soil Sampling Point: AR1-SPU

Profile Descr	iption: (Describe to	the depth r	eeded to document	the indic	ator or co	nfirm the a	absence of indicators.)				
Depth	Matrix		Red								
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks			
0-4	7.5YR 2.5/3	100					Silt Loam				
				-							
						-					
							-				
				-			-				
¹ Type: C=Cond	centration. D=Depletion	n. RM=Redu	ced Matrix, CS=Covere	d or Coate	ed Sand Gra	ins ² Loca	ition: PL=Pore Lining. M=Ma	atrix			
Hydric Soil I							Indicators for Proble				
Histosol (Dark Surface (S	67)				-			
	pedon (A2)		Polyvalue Belov	•	(S8) (MLRA	147,148)	2 cm Muck (A10)	,			
Black Hist			Thin Dark Surfa				Coast Prairie Redo	ox (A16)			
	Sulfide (A4)		Loamy Gleyed N			.0)	(MLRA 147,148)				
	Layers (A5)		Depleted Matrix		,		Piedmont Floodpla	ain Soils (F19)			
_	k (A10) (LRR N)		Redox Dark Sur				(MLRA 136, 147)				
				` ,	7)						
	Below Dark Surface (A	11)	Depleted Dark S		/)		Other (Explain in	Remarks)			
	k Surface (A12)		Redox Depressi		(540) (155						
Sandy Mu MLRA 147	ck Mineral (S1) (LRR N ', 148)	,	Iron-Manganese MLRA 136)	e Masses ((F12) (LRR I	N,					
Sandy Gle	yed Matrix (S4)		Umbric Surface	(F13) (ML	RA 136, 12	2)	2				
Sandy Red	dox (S5)		Piedmont Flood	lplain Soils	(F19) (MLF	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
Stripped N	Matrix (S6)		Red Parent Mat	terial (F21)	(MLRA 127	7, 147)	unless disturbed or problematic.				
	ayer (if observed):										
Type: <u>ro</u>							Hydric Soil Present?	Yes ○ No •			
Depth (incl	nes): <u>4''</u>						nyunc son Present?	res Uno U			
Remarks:											

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Bo	erks Co. Sampling Date: 10-Aug-16
pplicant/Owner: Birdsboro Power,	LLC	State:	PA Sampling Point: ARK1-SPW
vestigator(s): KR, JY		Section, Township, Range:	S TR
andform (hillslope, terrace, etc.):	Swale	Local relief (concave, convex	s, none):concave Slope:1.0% /0.
ubregion (LRR or MLRA): MLRA	A 148 in LRR S La	– it.: 40.275421 L .	.ong.: -75.82298
oil Map Unit Name: Birdsboro sil			NWI classification: PEM
re climatic/hydrologic conditions		f year? Yes No (If n	no, explain in Remarks.)
re Vegetation 🗸 , Soil 🗌		,	nal Circumstances" present? Yes No •
		•	iai direametanees present.
re Vegetation, Soil 🗸	, or Hydrology 🔲 natural	ly problematic? (If needed	d, explain any answers in Remarks.)
Summary of Findings - A	ttach site map showing	g sampling point location	ons, transects, important features, et
Hydrophytic Vegetation Present?	Yes ● No ○		
Hydric Soil Present?	Yes No	Is the Sampled Area	Yes No
Wetland Hydrology Present?	Yes No	within a Wetland?	res o NO o
Remarks:			
Wetland ARK1 recieves it's hydro periodic mowing. Red parent materials			tion was considered significantly disturbed due to
periodic mowing. Red parent mai	teriai soiis were eviderit, resultiri	g in soils being considered flatur	ану рговієтнанс.
			_
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of o			Surface Soil Cracks (B6)
Surface Water (A1)	☐ True Aquatic P		Sparsely Vegetated Concave Surface (B8)
☐ High Water Table (A2) ✓ Saturation (A3)	Hydrogen Sulfi		✓ Drainage Patterns (B10)
Water Marks (B1)		spheres along Living Roots (C3) educed Iron (C4)	✓ Moss Trim Lines (B16)✓ Dry Season Water Table (C2)
Sediment Deposits (B2)		eduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surf	• •	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain		Stunted or Stressed Plants (D1)
Iron Deposits (B5)	□ Other (Explain	in Remarks)	Geomorphic Position (D2)
Inundation Visible on Aerial Image	ery (B7)		Shallow Aguitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)			FAC-neutral Test (D5)
Field Observations:			
Surface Water Present? Yes	O No Depth (inches	s):	
Water Table Present? Yes	No O Depth (inche:	c).	
0.1 11 5 10		Wetland Hy	ydrology Present? Yes 🌘 No 🔾
(includes capillary fringe) Yes	No Depth (inches	s):0	
Describe Recorded Data (stream g	gauge, monitoring well, aerial ph	otos, previous inspections), if av	vailable:
Remarks:			

		—Species? -		Sampling Point: ARK1-SPW
Tree Stratum (Plot size:)	Absolute % Cover	Rel.Strat.	Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:1(A)
2		0.0%		T. IN I GO TO TO
3	0	0.0%		Total Number of Dominant Species Across All Strata: 1 (B)
4	_	0.0%		
5	0	0.0%		Percent of dominant Species That Are OBL_FACW_or_FAC: 100.0% (A/B)
6		0.0%		That Are OBL, FACW, or FAC:100.0% (A/B)
7	0	0.0%		Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
Olot size:	0 :	= Total Cover		0BL speci es x 1 =0
Sapling-Sapling/Shrub Stratum (Plot size:)		0.00/		FACW species 9 x 2 = 18
1		0.0%		FAC speci es
2		0.0%		FACU species x 4 =0
3	_			UPL speci es $0 \times 5 = 0$
4		0.0%		Column Totals: 101 (A) 294 (B)
5				
6		0.0%		Prevalence Index = B/A = 2.911
7		0.0%		Hydrophytic Vegetation Indicators:
8	_	0.0%		Rapid Test for Hydrophytic Vegetation
9		0.0%		✓ Dominance Test is > 50%
10		0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		= Total Cover	•	☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2		0.0%		
3		0.0%		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		0.0%		
5		0.0%		Definition of Vegetation Strata:
6		0.0%		Four Vegetation Strata: Tree stratum – Consists of woody plants, excluding vines, 3 in.
7		0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	=	= Total Cover	•	regardless of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	85	84.2%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Cyperus esculentus	5	5.0%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Juncus tenuis	5	5.0%	FAC	regardless of size, and all other plants less than 3.28 ft tall.
4. Echinochioa crus-galli		2.0%	FAC	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Impatiens capensis			FACW	
6. Epiloblum coloratum			FACW	Five Vegetation Strata:
7				Tree - Woody plants, excluding woody vines, approximately 20
8				ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9	0	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10	0			vines, approximately 20 ft (6 m) or more in height and less
11	0			than 3 in. (7.6 cm) DBH.
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	101 :	= Total Cover	'	Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0	0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0	0.0%		m) in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%		Hydrophytic
6	0	0.0%		Hydrophytic Vegetation
	0	= Total Cove	r	Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is significantly disturbed due to periodic mowing, resulting in a low diversity of plant species within the sample plot. The presence of hydrophytic vegetation was evident within the sample plot, albeit in low numbers.

Soil Sampling Point: ARK1-SPW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Denth Matrix Redox Features													
Depth		Matrix											
(inches)		(moist)	%		(moist)	%_	Type	Loc2	<u>Texture</u>	Remarks			
	10YR	4/2	- 98	7.5YR	_ 4/6	2	C	M	Silty Clay				
2-6	7.5YR	4/3	95	5YR	4/6	5	C	M	Silty Clay				
				-	_		-	-					
-	-	-		-	-	-	-	-					
¹ Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ² Location: PL=Pore Lining. M=Matrix													
Hydric Soil I		:							Indicators for Probl	ematic Hydric Soils ³ :			
Histosol (•				k Surface (2 cm Muck (A10)	(MLRA 147)			
	pedon (A2)					w Surface (Coast Prairie Red	ox (A16)			
Black Hist	` '	`				ace (S9) (N		148)	(MLRA 147,148)				
	Sulfide (A4 Layers (A5)					Matrix (F2))		Piedmont Floodp				
	k (A10) (LR			✓ Depleted Matrix (F3) Redox Dark Surface (F6) MERA 136, 147) Very Shallow Dark Surface (TE12)									
			11)	_		Surface (F	7)		☐ Very Shallow Dark Surface (TF12)				
	Below Dark k Surface (A		(11)		lox Depress		,,	Uther (Explain in Remarks)					
	ick Mineral (•	N.		•	se Masses ((F12) (LRR	N,					
MLRA 147	7, 148)	(31) (EKK 1	ν,		RA 136)		. , ,	·					
Sandy Gle	eyed Matrix	(S4)		Um	bric Surface	e (F13) (ML	RA 136, 1	22)	2				
Sandy Red	dox (S5)			Pie	dmont Floo	dplain Soils	(F19) (ML	RA 148)	Indicators of wetland hy	hydrophytic vegetation and drology must be present,			
Stripped N	Matrix (S6)			Rec	l Parent Ma	iterial (F21)) (MLRA 12	7, 147)	unless disturbed or problematic.				
Restrictive La	aver (if ob	served):											
Type: _ro													
Depth (incl	hes):_ <u>6''</u>								Hydric Soil Present?	Yes No			
Remarks:													
Soils were con	nsidered to	o he nati	rally probl	ematic due	to red pa	rent mate	erial soils						
CONS WOLC CO.	noidor od t	o bo nate	any probi	omano aac	to rou pe	ironi mati	orial sons.						

Project/Site: Birdsboro Pow	er LLC		City/County:	Exeter Twp./Berks	Co.	Sampling Da	ate: 10-Aug-16
Applicant/Owner: Birdsbord	Power, LLC			State: PA	Samp	oling Point:	ARK4-SPW
Investigator(s): KR, JY			Section, Towns	ship, Range: S	т_		R
Landform (hillslope, terrace,	etc.): Lowland		Local relief (con	cave, convex, nor	ne): concave	e Slop	e: <u>1.0%</u> / _{0.6} °
Subregion (LRR or MLRA):	MLRA 148 in LRR	S Lat.:	40.274425	Long.	-75.823518		Datum: NAD 83
Soil Map Unit Name: Birds			101271120			fication: PFC	_
Are climatic/hydrologic cond			ear? Yes 💿 N	lo C (If no e	xplain in Rema		
Are Vegetation \Box , So			tly disturbed?	` '	ircumstances"		Yes No
Are Vegetation \square , So		_	problematic?		plain any answ	present.	
Summary of Finding	_ , ,						•
Hydrophytic Vegetation Pro	esent? Yes •	No O					
Hydric Soil Present?	Yes	No O	Is the S	ampled Area 🗸	es • No		
Wetland Hydrology Presen	t? Yes 💿	No O	within a	Wetland?	es © NO C		
Remarks: The wetland system recie abutting railroad.	ves its hydrology fro	m watercourses ARK2	, ARK3, and ARK	5 and continually	maintains it du	ue to being da	ammed by the
abutting railload.							
Hydrology							
Wetland Hydrology Indicat	tors:				Secondary Indicat	ors (minimum c	of two required)
Primary Indicators (minim	um of one required;	check all that apply)			Surface Soil Ci		
Surface Water (A1)		True Aquatic Plant	ts (B14)		Sparsely Vege	tated Concave	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide	Odor (C1)		Drainage Patte	erns (B10)	
Saturation (A3)		Oxidized Rhizosph	eres along Living Ro	oots (C3)	Moss Trim Lin	es (B16)	
Water Marks (B1)		Presence of Reduc	ced Iron (C4)		Dry Season W	ater Table (C2)	
Sediment Deposits (B2)		Recent Iron Reduc	ction in Tilled Soils (C6)	Crayfish Burro	ws (C8)	
Drift deposits (B3)		Thin Muck Surface	e (C7)		Saturation Visi	ible on Aerial In	nagery (C9)
☐ Algal Mat or Crust (B4)		Other (Explain in F	Remarks)		Stunted or Str	essed Plants (D	1)
Iron Deposits (B5)			,		Geomorphic P	osition (D2)	
Inundation Visible on Aeri	ial Imagery (B7)				Shallow Aquita	ard (D3)	
✓ Water-Stained Leaves (B9	9)				_	ohic Relief (D4)	
Aquatic Fauna (B13)	•				FAC-neutral To		
Field Observations:						()	
Surface Water Present?	Yes ○ No •	Depth (inches):					
Water Table Present?	Yes ○ No •	Depth (inches):					
Saturation Present?	Yes ● No ○	Depth (inches):	0	Wetland Hydrol	ogy Present?	Yes 💿	No O
(includes capillary fringe) Describe Recorded Data (s				ections) if availab	ole:		
Dosonibo Nocordea Data (s	trouiri ga a go, mome	oring well, derial priote	os, provious mape	otions), ii availak	510.		
Remarks:							

			ominant		Sampling Point: ARK4-SPW		
Tree Stratum (Plot size: 30')	Absolute % Cover	Re	ecies? el.Strat. over	Indicator Status			
1. Acer negundo	50	✓.	66.7%	FAC	Number of Dominant Species That are OBL, FACW, or FAC:5(A)		
2. Acer rubrum	20	\mathbf{V}	26.7%	FAC			
3. Fraxinus pennsylvanica	5		6.7%	FACW	Total Number of Dominant Species Across All Strata: 6 (B)		
4	0		0.0%				
5	0		0.0%		Percent of dominant Species That Are OBL_FACW_or_FAC: 83.3% (A/B)		
ò			0.0%		That Are OBL, FACW, or FAC: 83.3% (A/B)		
7	0		0.0%		Prevalence Index worksheet:		
3	0		0.0%		Total % Cover of: Multiply by:		
(Plot size) 15	,75 =	= To	tal Cove	r	0BL speci es x 1 =0		
Sapling-Sapling/Shrub Stratum (Plot size: 15'	20	~	00.00/	FAC	FACW species 5 x 2 = 10		
Lindera benzoin			80.0%	FAC	FAC species 100 x 3 = 300		
		<u> </u>	20.0%	FACU	FACU species $5 \times 4 = 20$		
3		Η.	0.0%		UPL species $0 \times 5 = 0$		
		Η.	0.0%		Col umn Total s: 110 (A) 330 (B)		
j		Η.	0.0%				
		Η.	0.0%		Prevalence Index = B/A = 3.000		
<u></u>		Η.	0.0%		Hydrophytic Vegetation Indicators:		
3		Η.	0.0%		Rapid Test for Hydrophytic Vegetation		
9		Η.	0.0%		✓ Dominance Test is > 50%		
)		Ш.	0.0%		✓ Prevalence Index is ≤3.0 ¹		
Shrub Stratum (Plot size:)	25 =	= To	otal Cove	r	Morphological Adaptations ¹ (Provide supporting		
	0	Ш.	0.0%		data in Remarks or on a separate sheet)		
2.	0	Ш.	0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)		
3			0.0%		¹ Indicators of hydric soil and wetland hydrology must		
l			0.0%		be present, unless disturbed or problematic.		
5			0.0%		Definition of Vegetation Strata:		
5			0.0%		Four Vegetation Strata:		
7			0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in (7.6 cm) or more in diameter at breast height (DBH),		
lerb Stratum (Plot size: <u>5'</u>)		= To	otal Cove	r	regardless of height.		
Microstegium vimineum	5	V	50.0%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding		
Acer negundo			50.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb stratum – Consists of all herbaceous (non-woody) plants		
3.		\Box	0.0%		regardless of size, and all other plants less than 3.28 ft tall.		
	0		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft		
·	0		0.0%		in height.		
S			0.0%		Fire Wassatsking Charles		
			0.0%		Five Vegetation Strata:		
3	_		0.0%		Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in		
).).		\square	0.0%		diameter at breast height (DBH).		
)		$\overline{\Box}$	0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less		
		$\overline{\Box}$	0.0%		than 3 in. (7.6 cm) DBH.		
)		$\overline{\Box}$	0.0%		Shrub stratum – Consists of woody plants, excluding woody		
		 = To	tal Cove	r	vines, approximately 3 to 20 ft (1 to 6 m) in height.		
Noody Vine Stratum (Plot size:)					Herb stratum – Consists of all herbaceous (non-woody) plants including herbaceous vines, regardless of size, and woody		
			0.0%		species, except woody vines, less than approximately 3 ft (1		
2.			0.0%		m) in height.		
3.			0.0%		Woody vines – Consists of all woody vines, regardless of height.		
J			0.0%		_		
5		\sqsubseteq	0.0%		Hydrophytic		
5					Vegetation V		
	0	- T	otal Cove	r	Present? Yes No V		

Soil Sampling Point: ARK4-SPW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth	Depth Matrix Redox Features										
(inches)		(moist)	%	Color	(moist)	%_	Tvpe 1	Loc²	Texture	Remarks	
0-6	7.5YR	4/2	_ 85						Silty Clay		
	7.5YR	4/3	15	-					sand		
6-8	10YR	3/2	100						Silt Loam		
8-16	5YR	4/2	90	5YR	5/6	5	С	М	Silty Clay Loam		
		-	-	black		5	С	М			
	-										
				-							
						_					
¹ Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ² Location: PL=Pore Lining. M=Matrix											
Hydric Soil I	indicators:								Indicators for Problem	natic Hydric Soils ³ :	
Histosol (A	A1)			Dar	k Surface	(S7)			2 cm Muck (A10) (N		
	pedon (A2)						(S8) (MLRA		Coast Prairie Redox		
Black Hist							/ILRA 147, 1	48)	(MLRA 147,148)	(110)	
	Sulfide (A4 Layers (A5)					Matrix (F2))		Piedmont Floodplair	ı Soils (F19)	
	k (A10) (LR				leted Matr	ıx (F3) ırface (F6)			(MLRA 136, 147)		
			11)			Surface (F	7)				
	Below Dark k Surface (<i>A</i>		(11)		ox Depres		,,		Other (Explain in Re	emarks)	
	ck Mineral (•	N				(F12) (LRR	V,			
MLRA 147		OT) (ERRET	• /		PA 136)						
Sandy Gle	eyed Matrix	(S4)		Um	bric Surfac	e (F13) (MI	LRA 136, 12	2)	3 1	drophytic vegetation and	
Sandy Red						•	s (F19) (MLF		wetland hydro	ology must be present,	
☐ Stripped N	Matrix (S6)			Red	Parent Ma	aterial (F21) (MLRA 12	7, 147)	unless disturbed or problematic.		
Restrictive La	ayer (if ob	served):									
Type:											
Depth (incl	hes):								Hydric Soil Present?	Yes ● No ○	
Remarks:											

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Berks C	Co. Sampling Date: 10-Aug-16
Applicant/Owner: Birdsboro Power	·, LLC	State: PA	Sampling Point: ARK-SPU
Investigator(s): KR, JY		Section, Township, Range: S	T R
Landform (hillslope, terrace, etc.):	Hillside	Local relief (concave, convex, non	e): _convex
Subregion (LRR or MLRA): MLR	A 148 in LRR S Lat.	: 40.274942 Long. :	-75.823511 Datum: NAD 83
Soil Map Unit Name: Birdsboro si	ilt loam (BmB)		NWI classification: UPL
Are climatic/hydrologic conditions	on the site typical for this time of	vear? Yes O No (If no, ex	cplain in Remarks.)
Are Vegetation, Soil		•	rcumstances" present? Yes No
Are Vegetation , Soil	, , , , = ,	_	plain any answers in Remarks.)
Summary of Findings - A	Attach site map showing	sampling point locations,	transects, important features, etc.
Hydrophytic Vegetation Present?	Yes ○ No •		
Hydric Soil Present?	Yes ○ No •	Is the Sampled Area	es O No 💿
Wetland Hydrology Present?	Yes ○ No •	within a Wetland?	
Hydrology			
Hydrology			
Wetland Hydrology Indicators:			econdary Indicators (minimum of two required)
	one required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1) High Water Table (A2)	☐ True Aquatic Plar☐ Hydrogen Sulfide		Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
Saturation (A3)	_ , ,	heres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Redu		Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Redu	uction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surfac	e (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in	Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	(D7)	L	Geomorphic Position (D2)
Inundation Visible on Aerial ImagWater-Stained Leaves (B9)	jery (B7)		Shallow Aquitard (D3) Microtopographic Relief (D4)
Aguatic Fauna (B13)			FAC-neutral Test (D5)
Field Observations:			The headal rest (55)
Surface Water Present? Yes	O No Depth (inches):		
Water Table Present? Yes	O No Depth (inches):		
Saturation Present? (includes capillary frings) Yes		Wetland Hydrolo	ogy Present? Yes O No 🖲
(Includes capillally Intrige)		tos, previous inspections), if availab	le·
Describe Resorted Data (Stream	gaage, monitoring wen, dental prio	tos, providus inspections, in availab	
Remarks:			
no hydrology indicators were obs	served		

			ominant		Sampling Point: ARK-SPU
	Absolute % Cover	Re	ecies? - el.Strat. over	Indicator Status	Dominance Test worksheet:
1. Fraxinus americana	40	✓	57.1%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:3 (A)
2. Platanus occidentalis	20	✓.	28.6%	FACW	T. IN I SP. IV.
3. Ulmus americana	5		7.1%	FACW	Total Number of Dominant Species Across All Strata: 8 (B)
4. Celtis occidentalis	5		7.1%	FACU	
5	0		0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 37.5% (A/B)
6	0		0.0%		That are obt, facw, or fac.
7	0	Ш.	0.0%		Prevalence Index worksheet:
8	0	\sqcup	0.0%		Total % Cover of: Multiply by:
_Sapling-Sapling/Shrub Stratum (Plot size: _15')	70	= To	tal Cover		0BL speci es x 1 =0
	15	~	60.0%	FAC	FACW species
Lindera benzoin Acer negundo	10		40.0%	FAC	FAC speci es x 3 =
3.		Π.	0.0%		FACU species $90 \times 4 = 360$
4		\Box	0.0%		UPL speci es x 5 =0
5		\Box	0.0%		Column Totals: 140 (A) 485 (B)
6		\Box	0.0%		Dravalance Index D/A 2.4/4
7		\Box	0.0%		Prevalence Index = B/A = 3.464
8		\Box	0.0%		Hydrophytic Vegetation Indicators:
9		$\overline{\Box}$	0.0%		Rapid Test for Hydrophytic Vegetation
		\Box	0.0%		☐ Dominance Test is > 50%
10	25	 = To	tal Cover		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')		_			Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1. Rosa multiflora		✓.	60.0%	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Rubus phoenicolasius		V	40.0%	FACU	
3		Н.	0.0%		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		Ц.	0.0%		
5		Ц.	0.0%		Definition of Vegetation Strata:
6		Ц.	0.0%		Four Vegetation Strata: Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0	Ш.	0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	25	= To	tal Cover		regardless of height.
1. Lonicera japonica	10	✓.	50.0%	FACU	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Parthenocissus quinquefolia	10	✓	50.0%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,
3	0		0.0%		regardless of size, and all other plants less than 3.28 ft tall.
4	0	\sqcup	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5	0	\sqcup	0.0%		
6	0	\sqsubseteq	0.0%		Five Vegetation Strata:
7	0	\sqcup	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		Ц.	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9	0	Ц.	0.0%		diameter at breast height (DBH). Sapling stratum – Consists of woody plants, excluding woody
10		\sqsubseteq	0.0%		vines, approximately 20 ft (6 m) or more in height and less
11	0	\sqsubseteq	0.0%		than 3 in. (7.6 cm) DBH.
12	0	Ш.	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
	20	= To	tal Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0		0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0		0.0%		m) in height.
3.			0.0%		Woody vines – Consists of all woody vines, regardless of
4	0		0.0%		height.
5	0		0.0%		Under hodie
6.	0		0.0%		Hydrophytic Vegetation
	0	= To	otal Cove		Present? Yes No •
Remarks: (Include photo numbers here or on a separate shee	et.)				ı
no hydrophytic vegetation indicators observed	,				

Soil Sampling Point: ARK-SPU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth	Matrix		Re	dox Featu							
(inches)	Color (moist)		Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks			
0-6	7.5YR 4/4	100					Silt Loam				
							-				
N-				_			-				
				_			-				
			-	-	-						
1 Type: C=Cond	rentration D=Depletion	n RM=Reduc	ed Matrix CS=Cover	ed or Coate	d Sand Gra	ains 2loca	tion: PL=Pore Lining. M=Ma	atrix			
		II. KW-Kedac	ed Matrix, C3-Cover	eu or coate	u Sanu Ora	all is Loca					
Hydric Soil I			David Confess ((C7)			Indicators for Proble	matic Hydric Soils ³ :			
Histosol (·		Dark Surface (CO) /MIDA	147 140)	2 cm Muck (A10)	(MLRA 147)			
Black Hist	pedon (A2)		Polyvalue Belo				Coast Prairie Redo	ox (A16)			
	, ,		Thin Dark Surf		LRA 147,	148)	(MLRA 147,148)				
	Sulfide (A4) Layers (A5)		Loamy Gleyed				Piedmont Floodpla	ain Soils (F19)			
			Depleted Matri				(MLRA 136, 147)				
	k (A10) (LRR N)		Redox Dark Su		n)			Surface (TF12)			
	Below Dark Surface (A	11)	Depleted Dark)		Other (Explain in Remarks)				
	k Surface (A12)		Redox Depress		F12) /I DD	N.I.					
Sandy Mu MLRA 147	ck Mineral (S1) (LRR N 7, 148)	l,	Iron-Manganes MLRA 136)								
Sandy Gle	eyed Matrix (S4)		Umbric Surface	e (F13) (ML	RA 136, 12	22)	3 1 11 1	nydrophytic vegetation and			
Sandy Red	dox (S5)		☐ Piedmont Floo	dplain Soils	(F19) (ML	RA 148)	wetland hyd	rology must be present,			
Stripped M	Matrix (S6)		Red Parent Ma	iterial (F21)	(MLRA 12	7, 147)		turbed or problematic.			
Restrictive La	ayer (if observed):										
Type: _rc											
Depth (incl							Hydric Soil Present?	Yes O No 💿			
Remarks:	,										
	in diantana alaaamaad	1									
no nyaric soii	indicators observed	l									
i											

Project/Site: Birdsboro Power	LLC	City/County:	Exeter Twp./Berks Co.	Samplin	g Date: 05-Oct-16			
Applicant/Owner: Birdsboro P	ower, LLC		State: PA	Sampling Poin	t: ARK7-SPW			
Investigator(s): JY, PS		Section, Tow	nship, Range: S	т	R			
Landform (hillslope, terrace, et	c.): Terrace	Local relief (co	ncave, convex, none)	undulating	Slope: <u>1.0%</u> / <u>0.6</u> °			
Subregion (LRR or MLRA):	MLRA 148 in LRR S		Long.:	-75.822022	Datum: NAD 83			
– Soil Map Unit Name: Raritan	silt loam (RaB)			NWI classification:	PEM			
Are climatic/hydrologic conditi	ons on the site typical for	this time of year? Yes	No (If no, expl	ain in Remarks.)				
Are Vegetation 🗸 , Soil	, or Hydrology	significantly disturbed?		umstances" present?	Yes O No 💿			
Are Vegetation , Soil	, or Hydrology	naturally problematic?		in any answers in Re	marks.)			
Summary of Findings	- Attach site map	showing sampling po	oint locations, t	ransects, impo	rtant features, etc.			
Hydrophytic Vegetation Prese	ent? Yes No							
Hydric Soil Present?	Yes ● No ○	Is the	Sampled Area	● No ○				
Wetland Hydrology Present?	Yes ● No ○	within	n a Wetland?					
Remarks:								
Hydrology								
Wetland Hydrology Indicator		all theat amounts		ondary Indicators (minim	um of two required)			
Primary Indicators (minimun Surface Water (A1)		ali that apply) rue Aquatic Plants (B14)		Surface Soil Cracks (B6)	novo Curfago (DO)			
High Water Table (A2)		ydrogen Sulfide Odor (C1)		Sparsely Vegetated Cond Drainage Patterns (B10)	cave Surrace (B8)			
Saturation (A3)		xidized Rhizospheres along Living		Moss Trim Lines (B16)				
Water Marks (B1)		resence of Reduced Iron (C4)	ced Iron (C4) Dry Season Water Table (C2)					
Sediment Deposits (B2)	Re	ecent Iron Reduction in Tilled Soils	s (C6)	Crayfish Burrows (C8)				
Drift deposits (B3)	П	nin Muck Surface (C7)		Saturation Visible on Aer	ial Imagery (C9)			
Algal Mat or Crust (B4)	o	ther (Explain in Remarks)	_	Stunted or Stressed Plan	` '			
☐ Iron Deposits (B5)				Geomorphic Position (D2	2)			
Inundation Visible on Aerial	magery (B7)		Shallow Aquitard (D3)					
Water-Stained Leaves (B9) Aguatic Fauna (B13)				Microtopographic Relief FAC-neutral Test (D5)	(D4)			
Field Observations:				FAC-Heutral Test (D5)				
Surface Water Present?	′es ○ No •	Depth (inches):						
Water Table Present?	′es ○ No •	Depth (inches):						
			Wetland Hydrolog	y Present? Yes	● No ○			
(includes capillally irringe)		Depth (inches):	andiana) if available					
Describe Recorded Data (stre	am gauge, monitoring we	eii, aeriai pnotos, previous ins	pections), if available:					
Remarks:								
incinarios.								

		Dominant —Species? –		Sampling Point: <u>ARK7-SPW</u>			
Tree Stratum (Plot size:)	Absolute % Cover	Rel.Strat.	Indicator Status	Dominance Test worksheet:			
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC: (A)			
2	0	0.0%					
3		0.0%		Total Number of Dominant Species Across All Strata: 3 (B)			
4		0.0%	-	Specific visitors visit estatus			
5		0.0%		Percent of dominant Species			
6.		0.0%		That Are OBL, FACW, or FAC: 66.7% (A/B)			
7		0.0%		Prevalence Index worksheet:			
· ·		0.0%		Total % Cover of: Multiply by:			
8		= Total Cover		0BL species 0 x 1 = 0			
Sapling-Sapling/Shrub Stratum (Plot size:)		- rotal cover					
1	_	0.0%		FACW species 20 x 2 = 40			
2		0.0%		FAC species $\underline{77}$ x 3 = $\underline{231}$			
3.		0.0%		FACU speciles $\underline{5}$ x 4 = $\underline{20}$			
4		0.0%		UPL speci es			
5	-	0.0%		Column Totals: 102 (A) 291 (B)			
		0.0%					
6		0.0%		Prevalence Index = B/A =			
7		0.0%		Hydrophytic Vegetation Indicators:			
8		\Box		Rapid Test for Hydrophytic Vegetation			
9				✓ Dominance Test is > 50%			
10				✓ Prevalence Index is ≤3.0 ¹			
Shrub Stratum (Plot size: 15')	:	= Total Cover		Morphological Adaptations ¹ (Provide supporting			
1. Rosa multiflora	5	100.0%	FACU	data in Remarks or on a separate sheet)			
2	0	0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)			
3.	0	0.0%		¹ Indicators of hydric soil and wetland hydrology must			
4		0.0%		be present, unless disturbed or problematic.			
5		0.0%		Definition of Vegetation Strata:			
6.		0.0%		Four Vegetation Strata:			
	0	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.			
7		= Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.			
Herb Stratum (Plot size: _5')		_		Sapling/shrub stratum – Consists of woody plants, excluding			
1. Microstegium vimineum		61.9%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.			
2. Phalaris arundinacea		20.6%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.			
3. Solidago rugosa	10	10.3%	FAC	,			
4. Panicum virgatum	5	5.2%	FAC	Woody vines – Consists of all woody vines greater than 3.28 ft in height.			
5. Toxicodendron radicans	2		FAC				
6	0			Five Vegetation Strata:			
7	0	0.0%		Tree - Woody plants, excluding woody vines, approximately 20			
8	_	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in			
9	0_	0.0%		diameter at breast height (DBH).			
10	0	0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less			
11	0	0.0%		than 3 in. (7.6 cm) DBH.			
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody			
	97 :	= Total Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.			
Woody Vine Stratum (Plot size:)		0.00/		Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody			
1		0.0%		species, except woody vines, less than approximately 3 ft (1			
2	0			m) in height.			
3	0			Woody vines – Consists of all woody vines, regardless of height.			
4	0			noight.			
5	0	0.0%		Hydrophytic			
6	0	0.0%		Vegetation			
	0	= Total Cover	r	Present? Yes No V			

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation was considered significantly disturbed due to the sample plot's location within a periodically maintained lawn. It is expected that, should disturbance cease to continue, hydrophytic vegetation would dominate the wetland system.

Soil Sampling Point: ARK7-SPW

Profile Descr	iption: (De	escribe to	the depth	needed to	document	the indic	cator or co	nfirm the	absence of indicators.)				
Depth		Matrix			Re	dox Featı							
(inches)		(moist)	%		(moist)	%_	Tvpe 1	Loc2	Texture	Remarks			
0-8	10YR	4/2	97	7.5YR	4/6	3	C	M/PL	Silty Clay Loam				
8-14	10YR	4/2	90	7.5YR	4/6	10	С	M/PL	Silty Clay Loam				
	-	-	-	-	-								
	-			-					-				
	-			-					-				
		-			-	-							
				-									
										ļ			
¹ Type: C=Cond	centration. I	D=Depletion	on. RM=Red	uced Matrix,	CS=Covere	ed or Coat	ed Sand Gra	ins ² Loca	ntion: PL=Pore Lining. M=Ma	itrix			
Hydric Soil I	ndicators:								Indicators for Proble	matic Hydric Soils ³ :			
Histosol (A				Dar	k Surface (S7)				•			
Histic Epip	pedon (A2)			Poly	value Belov	w Surface	(S8) (MLRA	147,148)	2 cm Muck (A10) (
☐ Black Hist	ic (A3)			Thir	Dark Surfa	ace (S9) (N	ИLRA 147, 1	48)	Coast Prairie Redox (MLRA 147,148)	x (A16)			
Hydrogen	Sulfide (A4)		Loa	my Gleyed	Matrix (F2)		Piedmont Floodpla	in Sails (E10)			
Stratified	Layers (A5)			✓ Dep	leted Matri	x (F3)			(MLRA 136, 147)	III 30IIS (F 19)			
2 cm Mucl	k (A10) (LR	R N)		Red	ox Dark Su	rface (F6)	ce (F6) Very Shallow Dark Surface (TF12)						
☐ Depleted	Below Dark	Surface (A	A11)	☐ Dep	leted Dark	Surface (F	7)		Other (Explain in R				
☐ Thick Darl	k Surface (A	112)		Red	ox Depress	ions (F8)				,			
Sandy Mu MLRA 147	ck Mineral ((S1) (LRR	N,		-Manganes (A 136)	e Masses	(F12) (LRR	N,					
	eyed Matrix	(\$4)		_		e (F13) (M	LRA 136, 12	22)					
Sandy Red		(34)		_			s (F19) (MLI		³ Indicators of hydrophytic vegetation and				
	Matrix (S6)			_) (MLRA 12		wetland hydrology must be present, unless disturbed or problematic.				
outplear	viatrix (50)				T di Citt ivid	teriai (i z i) (WEIGH 12	, 147)	uriicas dist	dibed of probernatic.			
Restrictive La	ayer (if ob	served):											
Type:									Hydric Soil Present?	Yes ● No ○			
Depth (incl	hes):								Trydric Son Fresent:	Tes O NO O			
Remarks:													
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Project/Site: Birdsboro Power LLC	3		City/County:	Exeter Twp./Ber	rks Co.	Samp	ling Date:	05-Oct-16		
Applicant/Owner: Birdsboro Powe	er, LLC			State: PA	A	Sampling Po	int:	ARK7-SPU		
Investigator(s): JY, PS			Section, Town	nship, Range: S	S	т	R			
Landform (hillslope, terrace, etc.)): Terrace		ocal relief (co	ncave, convex,	none):	concave	Slope:	1.0% / 0.6 °		
Subregion (LRR or MLRA): ML	 RA 148 in LRR :	S Lat.:	40.275142	Lo	ng.: -	75.821280		atum: NAD 83		
Soil Map Unit Name: Raritan sill			10.270112			NWI classification				
Are climatic/hydrologic condition		nical for this time of year	r? Yes 💿	No C (If no		in in Remarks.)				
Are Vegetation . , Soil	on the site typ , or Hydrole			•		nstances" present	₂ Yes	● No ○		
	1					•	-			
Are Vegetation, Soil	, or Hydrol	ogy	oblematic?	(If needed,	explair	n any answers in R	emarks.)			
Summary of Findings -	Attach site	map showing sa	mpling po	int location	ns, tra	ansects, imp	ortant 1	features, etc.		
Hydrophytic Vegetation Present	? Yes	No 💿								
Hydric Soil Present?	Yes \bigcirc	No 💿		Sampled Area	ppled Area Yes O No •					
Wetland Hydrology Present?	$_{Yes} \bigcirc$	No •	within	a Wetland?	163 -	→ NO ○				
Remarks:										
Hydrology										
Wetland Hydrology Indicators:					Secon	dary Indicators (min	imum of tw	no required)		
Primary Indicators (minimum o	f one required;	check all that apply)				urface Soil Cracks (Bo		0.10.2		
Surface Water (A1)		True Aquatic Plants ((B14)		☐ Sp	parsely Vegetated Co	ncave Surf	ace (B8)		
High Water Table (A2)		Dr	rainage Patterns (B1	0)						
Saturation (A3)	es along Living F	Roots (C3)		oss Trim Lines (B16)						
Water Marks (B1)		Presence of Reduced	• •			ry Season Water Tab	le (C2)			
Sediment Deposits (B2)		Recent Iron Reduction		(C6)		rayfish Burrows (C8)		/a=1		
Drift deposits (B3)		Thin Muck Surface (0	•		_	aturation Visible on A	-	ery (C9)		
☐ Algal Mat or Crust (B4)☐ Iron Deposits (B5)		Other (Explain in Rer	marks)			unted or Stressed Pl eomorphic Position (
Inundation Visible on Aerial Ima	agery (B7)					nallow Aquitard (D3)	D2)			
Water-Stained Leaves (B9)						icrotopographic Relie	ef (D4)			
Aquatic Fauna (B13)						AC-neutral Test (D5)	, ,			
Field Observations:										
Surface Water Present? Yes	s ○ No ⑨	Depth (inches):								
Water Table Present? Yes	s O No 💿	Depth (inches):					O			
Saturation Present? (includes capillary frings) Yes	o No ●	Depth (inches):		Wetland Hyd	irology	Present? Yes	O No	•		
(includes capillary fringe) Describe Recorded Data (stream	n gauge, monito	oring well, aerial photos,	, previous insp	pections), if ava	nilable:					
Remarks:										
no hydrology indicators were ob	served									

			minant		Sampling Point: ARK7-SPU
	Absolute % Cover	Re	ecies? - el.Strat. ever	Indicator Status	Dominance Test worksheet:
1. Quercus rubra	50	V	66.7%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:3 (A)
2. Ulmus americana	15	V	20.0%	FACW	T
3. Carya glabra	10		13.3%	FACU	Total Number of Dominant Species Across All Strata: 6 (B)
4	0		0.0%		
5			0.0%		Percent of dominant Species
6	_		0.0%		That Are OBL, FACW, or FAC:50.0% (A/B)
7	0		0.0%		Prevalence Index worksheet:
8	0		0.0%		Total % Cover of: Multiply by:
	75	= To	tal Cover		0BL species 0 x 1 = 0
_Sapling-Sapling/Shrub Stratum (Plot size: _15')					FACW species 15 x 2 = 30
1. Cornus racemosa		✓_	57.1%	FAC	FAC species 25 x 3 = 75
2. Carya glabra		\	28.6%	FACU	FACU species 95 x 4 = 380
3. Quercus rubra	5	\sqcup	14.3%	FACU	l ·
4	0	\sqcup	0.0%		'
5	0	\sqcup	0.0%		Column Totals: <u>135</u> (A) <u>485</u> (B)
6	0	\sqcup	0.0%		Prevalence Index = B/A = 3.593
7	0	Ш.	0.0%		Hydrophytic Vegetation Indicators:
8	0		0.0%		Rapid Test for Hydrophytic Vegetation
9	0		0.0%		Dominance Test is > 50%
10	0		0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')		= To	tal Cover		Morphological Adaptations ¹ (Provide supporting
1. Rosa multiflora	20	V	100.0%	FACU	data in Remarks or on a separate sheet)
2		$\overline{\Box}$	0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
3.		$\overline{\Box}$	0.0%		¹ Indicators of hydric soil and wetland hydrology must
4		\Box	0.0%		be present, unless disturbed or problematic.
		\Box	0.0%		Definition of Vegetation Strata:
5		П-	0.0%		Four Vegetation Strata:
6	0		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7					(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	20		tal Cover		regardless of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Toxicodendron radicans	5	V	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0	\sqcup	0.0%		Herb stratum – Consists of all herbaceous (non-woody) plants,
3	0	\sqcup	0.0%		regardless of size, and all other plants less than 3.28 ft tall.
4		\sqcup	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5	0	\sqcup	0.0%		
6	0	\sqcup	0.0%		Five Vegetation Strata:
7	0	\sqcup	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8	0	Ш.	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9	0	Ш.	0.0%		diameter at breast height (DBH). Sapling stratum – Consists of woody plants, excluding woody
10	0		0.0%		vines, approximately 20 ft (6 m) or more in height and less
11	0		0.0%		than 3 in. (7.6 cm) DBH.
12	0		0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
	5	= To	tal Cover	•	Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0		0.0%		including herbaceous vines, regardless of size, and woody
	0		0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
2	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4			0.0%		height.
	0		0.0%		
5	0		0.0%		Hydrophytic
6	0		otal Cove		Vegetation Present? Yes ○ No ●
		- 10	cai cove	1	
Remarks: (Include photo numbers here or on a separate shee no hydrophytic vegetation indicators observed	et.)				

Soil Sampling Point: ARK7-SPU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth		Matrix		Re	dox Features						
(inches)		(moist)	%	Color (moist)	<u>% Tvp</u>	e Loc²	Texture	Remarks organic layer			
0-1	10YR	3/1	100				Silt				
1-9	10YR	3/3	100				Silt Loam				
9-14	7.5YR	5/3	_ 80				Silt Loam	-			
	5YR	4/6	20				Silt Loam				
14-16	5YR	4/6	60				Silt Loam				
	10YR	4/2	40				Silty Clay Loam				
-	-										
¹ Type: C=Cond	centration. I	D=Depletio	n. RM=Red	uced Matrix, CS=Cover	ed or Coated Sand	d Grains ² Loca	ition: PL=Pore Lining. M=	Matrix			
Hydric Soil I	ndicators:	1					Indicators for Prob	lematic Hydric Soils ³ :			
Histosol (A	A1)			Dark Surface (S7)		2 cm Muck (A10				
	pedon (A2)				w Surface (S8) (N		Coast Prairie Re				
Black Histi					ace (S9) (MLRA 1	47, 148)	(MLRA 147,148)				
	Sulfide (A4			Loamy Gleyed			Piedmont Flood				
	Stratified Layers (A5) 2 cm Muck (A10) (LRR N) Depleted Matrix (F3) Redox Dark Surface (F6)					(MLRA 136, 147					
	2 cm Muck (A10) (LRR N) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7)						ark Surface (TF12)				
	k Surface (A		111)	Redox Depress			Other (Explain in Remarks)				
	ck Mineral (•	V.		se Masses (F12) (I	_RR N,					
MLRA 147	7, 148)	(0.) (2	-,	MLRA 136)							
Sandy Gle	eyed Matrix	(S4)			e (F13) (MLRA 13		3 Indicators of	f hydrophytic vegetation and			
Sandy Red					dplain Soils (F19)		wetland h	ydrology must be present,			
☐ Stripped N	Matrix (S6)			Red Parent Ma	terial (F21) (MLR	A 127, 147)	unless	disturbed or problematic.			
Restrictive La	ayer (if ob	served):									
Type:											
Depth (inch	hes):						Hydric Soil Present?	Yes ○ No •			
Remarks:											
no hydric soil	indicators	observed	d								

Project/Site: Birdsboro Power LLC		City/County: Robeson Twp./B	erks Co. Sampling	Date: 04-Aug-16		
Applicant/Owner: Birdsboro Power, L	TC	State: PA	Sampling Point:	BR2-SPW		
Investigator(s): KR, JY		Section, Township, Range: S	т	R		
Landform (hillslope, terrace, etc.):	Swale	Local relief (concave, convex, n	none): concave Si	lope: 1.0% / 0.6 °		
Subregion (LRR or MLRA): MLRA	148 in LRR S Lat.:	40.284898 Lor	-75.856795	Datum: NAD 83		
Soil Map Unit Name: Lamington sill		10.201070	NWI classification: F			
Are climatic/hydrologic conditions of		ar? Yes • No O (If no.	, explain in Remarks.)			
				Yes ● No ○		
			Circumstances" present?			
Are Vegetation ☐ , Soil ✓ Summary of Findings - At			explain any answers in Remands. Is, transects, import			
Hydrophytic Vegetation Present?	Yes No	, , , , , , , , , , , , , , , , , , ,				
Hydric Soil Present?	Yes O No	Is the Sampled Area				
•	Yes O No	within a Wetland?	Yes No			
Wetland Hydrology Present? Remarks:	163 0 110 0					
Hydrology						
Wetland Hydrology Indicators:			Secondary Indicators (minimum	m of two required)		
Primary Indicators (minimum of or		(D1.4)	Surface Soil Cracks (B6)	0 ((D0)		
Surface Water (A1) High Water Table (A2)	☐ True Aquatic Plants		☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10)			
Saturation (A3)	☐ Hydrogen Sulfide O	res along Living Roots (C3)	Moss Trim Lines (B16)			
Water Marks (B1)	Presence of Reduce		Dry Season Water Table (02)		
Sediment Deposits (B2)		ion in Tilled Soils (C6)	Crayfish Burrows (C8)	,_,		
☐ Drift deposits (B3)	☐ Thin Muck Surface	(C7)	Saturation Visible on Aeria	I Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in Ro	emarks)	Stunted or Stressed Plants	(D1)		
☐ Iron Deposits (B5)			Geomorphic Position (D2)			
Inundation Visible on Aerial Imager	y (B7)		Shallow Aquitard (D3)			
Water-Stained Leaves (B9) Aquatic Fauna (B13)			✓ Microtopographic Relief (D✓ FAC-neutral Test (D5)	4)		
Field Observations:			FAC-neutral Test (D5)			
Surface Water Present? Yes	No Depth (inches):					
Water Table Present? Yes	' ' '					
			rology Present? Yes 💿	No O		
(includes capillary fringe) Yes		8				
Describe Recorded Data (stream ga	auge, monitoring well, aerial photo:	s, previous inspections), if avai	lable:			
5 .						
Remarks:						

		Dominant Engaine?		Sampling Point: BR2-SPW
Tree Stratum (Plot size:)	Absolute % Cover		Indicator Status	
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:4 (A)
2		0.0%		Total Number of Deminent
3		0.0%		Total Number of Dominant Species Across All Strata:5(B)
4		0.0%		
5	0	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)
6	0	0.0%		That Are OBL, FACW, OF FAC.
7	0			Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:	=	= Total Cove	r	0BL speci es x 1 =
1		0.0%		FACW species <u>40</u> x 2 = <u>80</u>
2.		0.0%		FAC species x 3 =30
3		0.0%		FACU speci es5 x 4 =20
4		0.0%		UPL speci es x 5 =
1		0.0%		Column Total s:75 (A)150 (B)
5 6		0.0%		Prevalence Index = B/A = 2.000
7		0.0%		
8		0.0%		Hydrophytic Vegetation Indicators:
9		0.0%		Rapid Test for Hydrophytic Vegetation
0		0.0%		✓ Dominance Test is > 50%
		= Total Cove	r	✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		0.0%	•	Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1				Problematic Hydrophytic Vegetation ¹ (Explain)
2		0.0%		
3		0.0%		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		0.0%		Definition of Vegetation Strata:
5		0.0%		Four Vegetation Strata:
6		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in
7		0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: <u>5'</u>)		= Total Cove	r	regardless of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Persicaria sagittata		26.7%	OBL	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Lythrum salicaria		13.3%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants
3. Onoclea sensibilis		13.3%	FACW	regardless of size, and all other plants less than 3.28 ft tall.
4. Impatiens capensis		13.3%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Phalaris arundinacea	5	6.7%	FACW	
6. Euthamia graminifolia	5	6.7%	FAC	Five Vegetation Strata:
7. Solidago rugosa		6.7%	FAC	Tree - Woody plants, excluding woody vines, approximately 20
8. Solidago canadensis		6.7%	FACU	ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9. Lysimachia ciliata		6.7%	FACW	diameter at breast height (DBH). Sapling stratum – Consists of woody plants, excluding woody
0				vines, approximately 20 ft (6 m) or more in height and less
1				than 3 in. (7.6 cm) DBH.
2		0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size: <u>30'</u>)	75=	= Total Cove	r	Herb stratum – Consists of all herbaceous (non-woody) plants
1 Lonicera spp.	30	100.0%	NI	including herbaceous vines, regardless of size, and woody
2		0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
3.		0.0%		Woody vines – Consists of all woody vines, regardless of
4		0.0%		height.
5.		0.0%		
5 6	0	0.0%		Hydrophytic Vegetation
o		= Total Cove		Present? Yes No
				1

Soil Sampling Point: BR2-SPW

Profile Descr	iption: (De	escribe to	the depth	needed to	documen	t the indic	cator or co	nfirm the	absence of indicators.)				
Depth		Matrix			Re	dox Featı	ıres						
(inches)		(moist)	%	Color	(moist)	%_	Type	Loc ²	Texture	Remarks			
0-8	7.5YR	4/2	100						Silty Clay Loam				
8-16	7.5YR	4/2	90	7.5YR	5/6	10	C	M	Silty Clay Loam				
		-		-	-								
-	-			-		-							
	-								-				
	-			-									
				-	-	_		-					
			on. RM=Red	uced Matrix,	CS=Cover	ed or Coate	ed Sand Gra	ins ² Loca	ation: PL=Pore Lining. M=Ma	trix			
Hydric Soil I									Indicators for Problem	natic Hydric Soils ³ :			
Histosol (•				k Surface (2 cm Muck (A10) (MLRA 147)			
	pedon (A2)						(S8) (MLRA		Coast Prairie Redox	(A16)			
Black Hist							MLRA 147, 1	48)	(MLRA 147,148)	(110)			
	Sulfide (A4				-	Matrix (F2))		Piedmont Floodplai	in Soils (F19)			
	Layers (A5)				leted Matri				(MLRA 136, 147)				
	k (A10) (LR			_	ox Dark Su	` ,	7)		☐ Very Shallow Dark	Surface (TF12)			
	Below Dark	•	(11)		ox Depress	Surface (F	7)		Other (Explain in Remarks)				
	k Surface (A	•			•		(F12) (LRR I	ı					
□□ Sandy Mu MLRA 147	ck Mineral (7. 148)	S1) (LRR I	٧,		RA 136)	se masses	(I IZ) (LKK I	ν,					
	eyed Matrix	(S4)		Um	bric Surfac	e (F13) (MI	LRA 136, 12	2)					
Sandy Re		` ,		Pied	dmont Floo	dplain Soils	s (F19) (MLF	A 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
	Matrix (S6)			Red	Parent Ma	iterial (F21) (MLRA 127	', 147)	wetland hydrology must be present, unless disturbed or problematic.				
Restrictive La	ayer (if ob	served):											
Type:									Hydric Soil Present?	Yes ● No ○			
Depth (incl	nes):								,	100 0 110 0			
Remarks:													

Project/Site: Birdsboro Pov	ver LLC		City/County: R	obeson Twp./Berks	s Co. Sam	pling Date: 04-Aug-16
Applicant/Owner: Birdsbore	o Power, LLC			State: PA	Sampling	Point: BR2-SPU
Investigator(s): KR, JY			Section, Towns	hip, Range: S	т	R
Landform (hillslope, terrace	, etc.): Terrace		Local relief (conc	ave, convex, non	e): level	Slope:/
Subregion (LRR or MLRA):	MLRA 148 in LRR	S Lat.:	40.284950	Long.:	-75.857150	Datum: NAD 83
Soil Map Unit Name: Birds	boro silt loam (BmB)				NWI classification	on: UPL
Are climatic/hydrologic con	ditions on the site ty	oical for this time of ye	ear? Yes 💿 No	(If no, ex	rplain in Remarks.)	
Are Vegetation \checkmark , So	il 🗌 , or Hydrol	ogy significant	tly disturbed?	Are "Normal Cir	rcumstances" prese	nt? Yes O No 💿
Are Vegetation $\ \ \Box$, So	il 🗌 , or Hydrol	ogy 🗌 naturally p	problematic?	(If needed, exp	olain any answers in	Remarks.)
Summary of Finding	=		sampling poir	nt locations,	transects, im	portant features, etc.
Hydrophytic Vegetation Pr		No 💿				
Hydric Soil Present?	Yes O	No 💿		mpled Area	es O No 💿	
Wetland Hydrology Presen	t? Yes	No •	within a	Wetland?		
Hardard a ma						
Hydrology						
Wetland Hydrology Indica				_ <u>S</u>	econdary Indicators (n	ninimum of two required)
Primary Indicators (minim	um of one required;		(044)		Surface Soil Cracks	• ,
Surface Water (A1) High Water Table (A2)		☐ True Aquatic Plant☐ Hydrogen Sulfide (Concave Surface (B8)
Saturation (A3)			eres along Living Ro	nts (C3)	☐ Drainage Patterns (I☐ Moss Trim Lines (B1	
Water Marks (B1)		Presence of Reduc	0 0		Dry Season Water T	·
Sediment Deposits (B2)			ction in Tilled Soils (C	(6)	Crayfish Burrows (C	
Drift deposits (B3)		Thin Muck Surface	e (C7)		Saturation Visible or	n Aerial Imagery (C9)
Algal Mat or Crust (B4)		Other (Explain in F	Remarks)		Stunted or Stressed	Plants (D1)
☐ Iron Deposits (B5)	(07)				Geomorphic Position	
Inundation Visible on Aer Water-Stained Leaves (B	0 3 . ,				Shallow Aquitard (D	
Aquatic Fauna (B13)	")					
Field Observations:					J TAC-fiedital Test (D	J)
Surface Water Present?	Yes O No •	Depth (inches):				
Water Table Present?	Yes ○ No •	Depth (inches):				
Saturation Present?	Yes ○ No ●	Depth (inches):		Wetland Hydrolo	ogy Present? Yo	es O No 💿
(includes capillary fringe)			ac provious inspo	etions) if availab	lo.	
Describe Recorded Data (s	iream gauge, monito	oring well, aerial prioto	os, previous irisped	ctions), ii availab	ie:	
Remarks:						
no hydrology indicators we	ere observed					
u. u	,, e esse. rea					

			ninant		Sampling Point: BR2-SPU
Tree Stratum (Plot size:)	Absolute % Cover	Rel.	- C. a.c.	Indicator Status	Dominance Test worksheet:
1	0		0.0%		Number of Dominant Species That are OBL, FACW, or FAC:
2	0		0.0%		
3.			0.0%	-	Total Number of Dominant Species Across All Strata: 3 (B)
4			0.0%		Species relies in strata.
5			0.0%		Percent of dominant Species
6		\Box	0.0%		That Are OBL, FACW, or FAC: 0.0% (A/B)
7		$\overline{\Box}$	0.0%		Prevalence Index worksheet:
•			0.0%		Total % Cover of: Multiply by:
8			al Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)		- 10ta	ai Covei		
1	_		0.0%		FACW species 0 x 2 = 0
2			0.0%		FAC species $\underline{5}$ x 3 = $\underline{15}$
3	0		0.0%		FACU species 45 x 4 = 180
4			0.0%		UPL species $\frac{65}{}$ x 5 = $\frac{325}{}$
5			0.0%		Col umn Total s: <u>115</u> (A) <u>520</u> (B)
6			0.0%		Prevalence Index = B/A = 4.522
7	-		0.0%		
8		$\overline{\Box}$	0.0%		Hydrophytic Vegetation Indicators:
9			0.0%		Rapid Test for Hydrophytic Vegetation
		<u> </u>			☐ Dominance Test is > 50%
10			0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')			al Cover		Morphological Adaptations ¹ (Provide supporting
1. Elaeagnus umbellata	5	⊻ _1	100.0%	UPL	data in Remarks or on a separate sheet)
2	0	\sqcup _	0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3	0	\sqcup_{-}	0.0%		Indicators of hydric soil and wetland hydrology must
4	0		0.0%		be present, unless disturbed or problematic.
5	0		0.0%		Definition of Vegetation Strata:
6			0.0%		Four Vegetation Strata:
7	0		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: _5')	5	= Tota	al Cover		regardless of height.
	40	✓	36.4%	UPL	Sapling/shrub stratum – Consists of woody plants, excluding
1. Glycine max	25		22.7%	FACU	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Dactylis glomerata	15		13.6%	UPL	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Daucus carota	10		9.1%	FACU	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Fragaria virginiana	10		9.1%	FACU	in height.
5. Rudbeckla hirta		H-			
6. Plantago lanceolata		<u> </u>	4.5%	UPL	Five Vegetation Strata:
7. Toxicodendron radicans		H-	4.5%	FACIL	Tree - Woody plants, excluding woody vines, approximately 20
8. Trifolium pratense		H-	0.0%	FACU	ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		H-	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10		Н_	0.0%		vines, approximately 20 ft (6 m) or more in height and less
11	0	Ц_	0.0%		than 3 in. (7.6 cm) DBH.
12		Ш_	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	110	= Tota	al Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0		0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2.	0		0.0%		m) in height.
3.	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4			0.0%		height.
5			0.0%		
	0	\Box	0.0%		Hydrophytic Vegetation
6	0		al Cove		Present? Yes No •
		- 100	ai Covei		
Remarks: (Include photo numbers here or on a separate shee	et.)				
no hydrophytic vegetation indicators observed					

Soil Sampling Point: BR2-SPU

Profile Descri	iption: (Descr	ibe to t	he depth	needed to docu	ment the in	dicator or c	onfirm the	absence of indicators.)					
Depth	М	atrix			Redox Fea	atures							
(inches)	Color (mo	oist)	<u>%</u>	Color (moi	st) %	Type	Loc ²	Texture	Remarks				
0-10	10YR4	/4	100					Silt Loam					
10-12	7.5YR 5	/4	70					Silt Loam					
	7.5YR 4	/4	30										
1 Type: C=Cond	entration D=Γ)enletion	n RM-Red	uced Matrix CS=(Overed or Co	ated Sand G	rains 21 oca	ation: PL=Pore Lining. M=Mat	triv				
Hydric Soil I		repletion	i. Kivi–Keu	uceu Matrix, C3-C	Sovered or Co	Jaleu Sanu O	Tallis Loca						
Histosol (A				Dark Sur	food (C7)			Indicators for Problem	natic Hydric Soils ³ :				
` =	•				ace (S7) Below Surface	oo (CO) (MID	۸ 147 140)	2 cm Muck (A10) (I	MLRA 147)				
Histic Epip					s веюж surrac k Surface (S9)			Coast Prairie Redox	(A16)				
Black Histi							148)	(MLRA 147,148)					
	Sulfide (A4) Layers (A5)			_	leyed Matrix (F2)		Piedmont Floodplai	n Soils (F19)				
					Matrix (F3) ark Surface (F	()		(MLRA 136, 147)					
	k (A10) (LRR N)		->		Dark Surface	,		☐ Very Shallow Dark					
	Below Dark Sur		1)		epressions (F8			Other (Explain in Remarks)					
	k Surface (A12)				ganese Masse	•	D NI						
☐ Sandy Mu MLRA 147	ck Mineral (S1) ', 148)	(LRR N,		MLRA 13	6)								
Sandy Gle	yed Matrix (S4))		Umbric S	Surface (F13)	(MLRA 136, 1	122)	³ Indicators of hydrophytic vegetation and					
Sandy Red	dox (S5)			Piedmon	t Floodplain S	oils (F19) (M	LRA 148)	wetland hydrology must be present,					
Stripped N	Natrix (S6)			Red Pare	ent Material (F	21) (MLRA 1	27, 147)		urbed or problematic.				
Restrictive La	ayer (if observ	ved):											
Type: <u>ro</u>	icks												
Depth (inch	nes): <u>12</u>							Hydric Soil Present?	Yes O No 💿				
Remarks:													
no hydric soil	indicators oh	carvad											
Tio flydric 30ii	indicators ob	isei veu											

Project/Site: Birdsboro Power LLC		City/County:	xeter Twp./Berks Co.	Sampli	ng Date: 18-Aug-16
Applicant/Owner: Birdsboro Power, L	LC		State: PA	Sampling Poir	nt: EX-SPU1
Investigator(s): KR, JY		Section, Towns	hip, Range: S	т	R
Landform (hillslope, terrace, etc.):	terrace/floodplain	Local relief (conc	ave, convex, none)	: concave	Slope:0.0% /0.0 °
Subregion (LRR or MLRA): MLRA	148 in LRR S	Lat.: 40.278331	Long.:	-75.835011	Datum: NAD 83
Soil Map Unit Name: Croton silt loa		10.270001		NWI classification:	
Are climatic/hydrologic conditions or		ne of year? Yes N	O (If no evol	ain in Remarks.)	
Are Vegetation, Soil		ificantly disturbed?	` ' '	umstances" present?	Yes ● No ○
		-		•	
Are Vegetation		rally problematic?		in any answers in Re	•
Hydrophytic Vegetation Present?	Yes No				·
Hydric Soil Present?	Yes O No •	Is the Sa	impled Area	O O	
Wetland Hydrology Present?	Yes O No 💿		Wetland?	○ No ●	
Remarks:					
Hardwalla ma		-			
Hydrology					
Wetland Hydrology Indicators:			Seco	ondary Indicators (minir	mum of two required)
Primary Indicators (minimum of or				Surface Soil Cracks (B6)	
Surface Water (A1)		tic Plants (B14)		Sparsely Vegetated Con	
☐ High Water Table (A2)☐ Saturation (A3)	_ , ,	Sulfide Odor (C1) hizospheres along Living Ro		Drainage Patterns (B10) Moss Trim Lines (B16))
Water Marks (B1)		fileduced Iron (C4)		Dry Season Water Table	n (C2)
Sediment Deposits (B2)		n Reduction in Tilled Soils ((Crayfish Burrows (C8)	e (G2)
Drift deposits (B3)		Surface (C7)	_	Saturation Visible on Ae	rial Imagery (C9)
Algal Mat or Crust (B4)		lain in Remarks)		Stunted or Stressed Plan	0 3 . ,
☐ Iron Deposits (B5)	□ Other (Exp	idin in Kemarks)		Geomorphic Position (D	` '
☐ Inundation Visible on Aerial Imager	ry (B7)			Shallow Aquitard (D3)	,
☐ Water-Stained Leaves (B9)				Microtopographic Relief	(D4)
Aquatic Fauna (B13)				FAC-neutral Test (D5)	
Field Observations:					
Surface Water Present? Yes	•	ches):			
Water Table Present? Yes	No O Depth (in	ches):		v Present? Yes	○ No ●
Saturation Present? (includes capillary fringe) Yes	No Depth (in	ches):	Wetland Hydrolog	y Present? 165	
Describe Recorded Data (stream ga	auge, monitoring well, aeria	I photos, previous inspe	ctions), if available:	:	
, , ,	3 .		,		
Remarks:					

Tree Stratum	5	Re		FACW FACU FACW FACU FACU FACU	Number of Dominant Species That are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: 6 (B) Percent of dominant Species
2. Platanus occidentalis 15 3. Fraxinus americana 10 4. Ulmus americana 5 5. Juglans nigra 5 6. 0 0 7. 0 0 8. 0 0 Sapling-Sapling/Shrub Stratum (Plot size: 15') 1. Lindera benzoln 20	5 [5 [5] [6] [6] [7] [7] [7] [7] [7] [7		18.8% 12.5% 6.3% 6.3% 0.0%	FACU FACU	That are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: 6 (B) Percent of dominant Species
3. Fraxinus americana 10 4. Ulmus americana 5 5. Juglans nigra 5 6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size: 15') 1. Lindera benzoln 20			12.5% 6.3% 6.3% 0.0%	FACU	Species Across All Strata:6(B) Percent of dominant Species
4. Ulmus americana 5 5. Juglans nigra 5 6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size: 15') 1. Lindera benzoin 20			6.3% 6.3% 0.0%	FACW	Species Across All Strata:6(B) Percent of dominant Species
4. Ulmus americana 5 5. Juglans nigra 5 6			6.3%		Percent of dominant Species
5. Juglans nigra 5 6			0.0%	FACU	
6					
7	[=		0.0%		That Are OBL, FACW, or FAC: 66.7% (A/B)
8	<u> </u>				Prevalence Index worksheet:
Sapling-Sapling/Shrub Stratum (Plot size: 15') 80 1. Lindera benzoln 20			0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size: 15') 1. Lindera benzoln 20		: To	tal Cover		OBL species 0 x 1 = 0
					FACW species 90 x 2 = 180
2. Acer negundo 5	<u> </u>	✓	57.1%	FAC	1
	[$\square_{\underline{\ }}$	14.3%	FAC	FAC species $55 \times 3 = 165$
3. Ulmus americana 5	[$\Box_{\scriptscriptstyle{\perp}}$	14.3%	FACW	FACU species 25 x 4 = 100
4. Viburnum sp. 5	[\Box _	14.3%	NI	UPL species $\frac{0}{x}$ x 5 = $\frac{0}{x}$
5	_ [0.0%		Column Total s: <u>170</u> (A) <u>445</u> (B)
6	[0.0%		Prevalence Index = B/A = 2.618
7	_ [0.0%		
8	_ [\Box^{\top}	0.0%		Hydrophytic Vegetation Indicators:
9	_ [\neg	0.0%		Rapid Test for Hydrophytic Vegetation
0	_	Ξ-	0.0%		✓ Dominance Test is > 50%
35	_ `		tal Cover		Y Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')					Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1. Nood Martinord		<u>~</u> _	100.0%	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2.	<u> </u>		0.0%		Problematic Hydrophytic Vegetation - (Explain)
3	<u> </u>	ᆜ-	0.0%		Indicators of hydric soil and wetland hydrology must
4	<u> </u>	ᆜ.	0.0%		be present, unless disturbed or problematic.
5	<u> </u>	$\Box_{.}$	0.0%		Definition of Vegetation Strata:
6	[$\square_{_}$	0.0%		Four Vegetation Strata:
	<u> </u>	$\Box_{_}$	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: <u>5'</u>)	=	То	tal Cover	•	regardless of height.
	5 [✓	21.4%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
O Observations 1		— ✓	21.4%	NI	Herb stratum – Consists of all herbaceous (non-woody) plants,
Z. 0190011d 5p.	- :	<u>~</u>	21.4%	FAC	regardless of size, and all other plants less than 3.28 ft tall.
O	0 [<u> </u>	14.3%		Woody vines – Consists of all woody vines greater than 3.28 ft
T.	<u> </u>	=-	14.3%	FACW	in height.
U	<u> </u>	=-	7.1%	FACU	
U, Taranonosao quinquorena)) [Π-	0.0%	IACO	Five Vegetation Strata:
)) [Η-			Tree - Woody plants, excluding woody vines, approximately 20
0		믁-	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
·-	<u> </u>	믁-	0.0%		Sapling stratum – Consists of woody plants, excluding woody
·-	[닠-	0.0%		vines, approximately 20 ft (6 m) or more in height and less
	<u> </u>	믁-	0.0%		than 3 in. (7.6 cm) DBH.
	<u> </u>	ᆜ_	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	_ =	То	tal Cover	•	Herb stratum – Consists of all herbaceous (non-woody) plants,
	[0.0%		including herbaceous vines, regardless of size, and woody
	 o [0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
			0.0%		Woody vines – Consists of all woody vines, regardless of
		$\overline{\neg}$	0.0%		height.
Ti)) [0.0%		
J		Η-			Hydrophytic
U	<u> </u>	IJ. - -	0.0%		Vegetation
) =	= To	tal Cove	r	

Soil Sampling Point: EX-SPU1

Profile Descr	iption: (De	escribe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators.					
Depth		Matrix		Rec	lox Featu								
(inches)	Color	(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	Texture	Rem	arks			
0-6	7.5YR	4/2+	100					Silty Clay Loam					
6-10	7.5YR	3/2	100					Silt Loam	fill				
	-							-					
	-				-								
			_										
¹ Type: C=Cond	centration. I	D=Depletio	n. RM=Red	uced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	ition: PL=Pore Lining. M	=Matrix				
Hydric Soil I	indicators:	l						Indicators for Pro	blematic Hydri	: Soils ³ :			
Histosol (A1)			Dark Surface (S	S7)				0) (MLRA 147)				
Histic Epip	pedon (A2)			Polyvalue Belov	v Surface ((S8) (MLRA	147,148)						
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148)					48)	Coast Prairie R (MLRA 147,148							
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2)						Piedmont Floo	dplain Soils (F19)						
	Stratified Layers (A5) Depleted Matrix (F3)						(MLRA 136, 14						
2 cm Muck (A10) (LRR N) Redox Dark Surface (F6)						Very Shallow [ark Surface (TF1	2)					
	Below Dark		.11)	Depleted Dark		7)		Other (Explain	in Remarks)				
	k Surface (A	•		Redox Depressi									
Sandy Muck Mineral (S1) (LRR N, MLRA 147, 148) Sandy Muck Mineral (S1) (LRR N, MLRA 136)					Ν,								
Sandy Gle	yed Matrix	(S4)		Umbric Surface	(F13) (ML	LRA 136, 12	2)	3					
Sandy Re	dox (S5)			☐ Piedmont Flood	dplain Soils	s (F19) (MLF	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.					
Stripped N	Matrix (S6)			Red Parent Mat	terial (F21)) (MLRA 127	7, 147)						
Do atulativa I	(if ala												
Restrictive La		servea):											
Depth (incl								Hydric Soil Present	P Yes ○	No •			
•	nes). <u>111</u>												
Remarks:													
chunks of coa	al, brick, gl	lass, and	concrete v	vere evident through	out the s	oil probe;	no eviden	ce of redoximorphic fe	atures were ob	served			

Project/Site: Birdsboro Powe	er LLC		City/County:	Exeter Twp./Berks C	Co. Samp	oling Date: 18-Aug-16
Applicant/Owner: Birdsboro	Power, LLC			State: PA	Sampling P	oint: EX-SPU2
Investigator(s): KR, JY			Section, Towns	hip, Range: S	т	R
Landform (hillslope, terrace,	etc.): floodplain		Local relief (cond	cave, convex, non	e): flat	Slope: / o
Subregion (LRR or MLRA):	MLRA 148 in LRR S	Lat.:	40.276657	Long.:	-75.835802	Datum: NAD 83
Soil Map Unit Name: Gibrali	ar silt loam (Gc)				NWI classification	 n: UPL
Are climatic/hydrologic condi		ical for this time of ve	ear? Yes • N	o (If no. ex	- (plain in Remarks.)	
Are Vegetation, Soil			ly disturbed?	` '	rcumstances" presen	t? Yes • No O
Are Vegetation . , Soil			roblematic?		plain any answers in	
Summary of Finding	s - Attach site	map showing s	ampling poi	nt locations,	transects, imp	oortant features, etc.
Hydrophytic Vegetation Pres	sent? Yes	No O				
Hydric Soil Present?	Yes 🔾	No 💿		ampled Area	es O No 💿	
Wetland Hydrology Present?	y Yes 💿	No O	within a	Wetland?	,5 ° 110 °	
the sample plot was locate wetland	d in a documented N	IWI (PFO1A); no hydi	ric soil characteri	stics were observ	ed, therefore the are	a was not considered a
Hydrology						
Wetland Hydrology Indicato	ors:			Se	econdary Indicators (mi	nimum of two required)
Primary Indicators (minimu	m of one required;	check all that apply)			Surface Soil Cracks (E	36)
Surface Water (A1)		True Aquatic Plants			Sparsely Vegetated C	
High Water Table (A2)		Hydrogen Sulfide C	• •		Drainage Patterns (B	
Saturation (A3)			eres along Living Ro	ots (C3)	Moss Trim Lines (B16	•
Water Marks (B1) Sediment Deposits (B2)		Presence of Reduce	• •		Dry Season Water Ta	
Drift deposits (B3)			tion in Tilled Soils (_6)	Crayfish Burrows (C8) Saturation Visible on	
Algal Mat or Crust (B4)		Thin Muck Surface	• •		Stunted or Stressed F	0 3 . ,
Iron Deposits (B5)		Other (Explain in R	emarks)		¬	, ,
Inundation Visible on Aeria	I Imagery (B7)				Shallow Aquitard (D3)	• ,
Water-Stained Leaves (B9)	0 3 . ,				Microtopographic Rel	
Aquatic Fauna (B13)				✓		• •
Field Observations:					,	
Surface Water Present?	Yes ○ No •	Depth (inches):				
Water Table Present?	Yes ○ No •	Depth (inches):				
Saturation Present?	Yes O No •	Depth (inches):		Wetland Hydrolo	ogy Present? Yes	s ● No ○
(includes capillary fringe) Describe Recorded Data (str			os, previous inspe	ctions), if availab	le:	
Remarks:						
Remarks.						

		_Sr	ecies? -		Sampling Point: <u>EX-SPU2</u>
	Absolute	Ré	el.Strat.	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')	% Cover	Co	ver	Status	Number of Dominant Species
1 Acer negundo	40	~	72.7%	FAC	That are OBL, FACW, or FAC:4 (A)
2. Celtis occidentalis	10		18.2%	FACU	
3. Platanus occidentalis	-	\Box	9.1%	FACW	Total Number of Dominant
		\Box	0.0%		Species Across All Strata:5(B)
4		\Box	0.0%		Percent of dominant Species
5		\vdash			That Are OBL, FACW, or FAC: 80.0% (A/B)
6		\vdash	0.0%		
7	0	\square	0.0%		Prevalence Index worksheet:
8	0	\square	0.0%		Total % Cover of: Multiply by:
Diet size, 15	,55	= To	tal Cove	r	0BL speci es0 x 1 =0
Sapling-Sapling/Shrub Stratum (Plot size: 15'	_ /				FACW species
1. Lindera benzoin	30		75.0%	FAC	FAC speciles 125 x 3 = 375
2. Viburnum sp.	10	V	25.0%	NI	FACU species 40 x 4 = 160
3	0	\square	0.0%		
4	0		0.0%		UPL species $0 \times 5 = 0$
5	0		0.0%		Column Totals: 215 (A) 635 (B)
6.	_		0.0%		Prevalence Index = B/A = 2.953
7			0.0%		
8		\Box	0.0%		Hydrophytic Vegetation Indicators:
		\Box	0.0%		Rapid Test for Hydrophytic Vegetation
9		\vdash			✓ Dominance Test is > 50%
10		Ш,	0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)	40	= To	tal Cove	r	Morphological Adaptations ¹ (Provide supporting
1	0		0.0%		data in Remarks or on a separate sheet)
2			0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
3.		\Box	0.0%		¹ Indicators of hydric soil and wetland hydrology must
4		$\overline{\Box}$	0.0%		be present, unless disturbed or problematic.
		\Box	0.0%		Definition of Vegetation Strata:
5		\vdash			Four Vegetation Strata:
6			0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0	\square	0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	0	= To	tal Cove	r	regardless of height.
1. Microstegium vimineum	50	~	38.5%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Impatiens capensis	40	V	30.8%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
	25		19.2%	FACU	regardless of size, and all other plants less than 3.28 ft tall.
3. Urtica dioica		\exists	3.8%	FACU	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Parthenocissus quinquefolia					in height.
5. Pilea pumila	5	\vdash	3.8%	FACW	
6. Persicaria virginiana		\vdash	3.8%	FAC	Five Vegetation Strata:
7	0		0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8	0	Ш	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9	0		0.0%		diameter at breast height (DBH).
0.			0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
11			0.0%		than 3 in. (7.6 cm) DBH.
	0	\Box	0.0%		Shrub stratum – Consists of woody plants, excluding woody
12		= Tc	tal Cove		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	130				Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0	Ш	0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0		0.0%		m) in height.
3.	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4			0.0%		height.
5	_	\Box	0.0%		
			0.0%		Hydrophytic
6					Vegetation Present? Yes No
	0	= 1	otal Cove)F	
Remarks: (Include photo numbers here or on a separate sh		= 10	otal Cove	<u> </u>	

Soil Sampling Point: EX-SPU2

Profile Descri	iption: (De	escribe to	the depth	needed to document	the indic	ator or co	nfirm the	absence of indicators.)				
Depth		Matrix		Rec	lox Featu							
(inches)	Color	(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	<u>Texture</u>	Remarks			
0-4	7.5YR	2.5/1	100					Silty Clay Loam				
4-8	7.5YR	3/1	100					sand				
8-12	black	_	80					Sand				
	5YR	4/4	20					Clay				
12-24	black		100					Sand				
	-			-								
	-											
¹ Type: C=Cond	centration. I	D=Depletion	on. RM=Red	uced Matrix, CS=Covere	d or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=Matr	ix			
Hydric Soil I	ndicators:	l						Indicators for Problem	natic Hydric Soils ³ :			
Histosol (A	A1)			Dark Surface (S	57)			2 cm Muck (A10) (M	•			
Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 147,148)						Coast Prairie Redox	·					
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148)				48)	(MLRA 147,148)	(A10)						
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2)					Piedmont Floodplain	ı Soils (F19)						
Stratified Layers (A5) Depleted Matrix (F3)					(MLRA 136, 147)							
☐ 2 cm Muck (A10) (LRR N) ☐ Redox Dark Surface (F6) ☐ Depleted Below Dark Surface (A11) ☐ Depleted Dark Surface (F7)						☐ Very Shallow Dark S						
	веюw Dark k Surface (A		(11)	Redox Depressi		")		Other (Explain in Remarks)				
	•	•	NI.	☐ Iron-Manganes		(F12) (LRR I	٧.					
Sandy Muck Mineral (S1) (LRR N, Iron-Manganese Masses (F12) (LRR N, MLRA 147, 148) MLRA 136)					•							
Sandy Gle	yed Matrix	(S4)		Umbric Surface	(F13) (ML	_RA 136, 12	2)	3	Lank BarrantaBarrant			
Sandy Red	dox (S5)			Piedmont Flood	lplain Soils	(F19) (MLF	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.				
Stripped N	Matrix (S6)			Red Parent Mat	erial (F21)) (MLRA 12	7, 147)					
Restrictive La	ayer (if ob	served):										
Type:												
Depth (inch	nes):							Hydric Soil Present?	Yes ○ No •			
Remarks:												
no hydric soil	indicators	observe	d									
-												

Project/Site: Birdsboro Power LLC		City/County:	Exeter Twp./Berks Co.	Sampling	Date: 22-Sep-16
Applicant/Owner: Birdsboro Power,	LLC		State: PA	Sampling Point:	EX3-SPW
Investigator(s): KR, JY		Section, Town	nship, Range: S	т	R
Landform (hillslope, terrace, etc.):	terrace/floodplain	Local relief (co	ncave, convex, none)	concave Sie	ope: <u>0.0%</u> / <u>0.0</u> °
Subregion (LRR or MLRA): MLRA	148 in LRR S	Lat.: 40.277345	Long.:	-75.837872	Datum: NAD 83
Soil Map Unit Name: Gibraltar silt	loam (Gc)			NWI classification: P	EM
Are climatic/hydrologic conditions o	on the site typical for this	time of year? Yes	No (If no, exp	lain in Remarks.)	
Are Vegetation 🗸 , Soil 🗸		significantly disturbed?	Are "Normal Circ	umstances" present?	Yes O No 💿
Are Vegetation, Soil	, or Hydrology	naturally problematic?		in any answers in Rema	arke)
Summary of Findings - At				-	
Hydrophytic Vegetation Present?	Yes ● No ○				
Hydric Soil Present?	Yes No		Sampled Area Voc	● No ○	
Wetland Hydrology Present?	Yes No	within	a Wetland?	O 140 O	
Remarks:					
The sample plot is located in a require periodic mowing. Soils were cons					
Hydrology					
Wetland Hydrology Indicators:			Sec	ondary Indicators (minimun	n of two required)
Primary Indicators (minimum of o	ne required; check all tha	at apply)		Surface Soil Cracks (B6)	
Surface Water (A1)	True Ac	quatic Plants (B14)		Sparsely Vegetated Concav	e Surface (B8)
High Water Table (A2)	Hydrog	en Sulfide Odor (C1)		Drainage Patterns (B10)	
Saturation (A3)	Oxidize	d Rhizospheres along Living I	_	Moss Trim Lines (B16)	
Water Marks (B1)	Present	ce of Reduced Iron (C4)		Dry Season Water Table (C	2)
Sediment Deposits (B2)	Recent	Iron Reduction in Tilled Soils	_	Crayfish Burrows (C8)	
Drift deposits (B3)	∐ Thin Mւ	uck Surface (C7)		Saturation Visible on Aerial	
Algal Mat or Crust (B4)	U Other (Explain in Remarks)		Stunted or Stressed Plants	(D1)
☐ Iron Deposits (B5)	(0.7)			Geomorphic Position (D2)	
Inundation Visible on Aerial Image	ry (B7)			Shallow Aquitard (D3)	
Water-Stained Leaves (B9)				Microtopographic Relief (D4	4)
Aquatic Fauna (B13) Field Observations:			<u> </u>	FAC-neutral Test (D5)	
Surface Water Present? Yes	No O Depth	ı (inches):			
Water Table Present? Yes		i (inches):			
	11.		Wetland Hydrolog	y Present? Yes •	No O
(includes capillary fringe) Yes		i (inches):			
Describe Recorded Data (stream g	auge, monitoring well, as	erial photos, previous insp	ections), if available	:	
Domorko					
Remarks:					

		—Species? –		Sampling Point: EX3-SPW
Tree Stratum (Plot size:)	Absolute % Cover	Rel.Strat.	Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC: (A)
2		0.0%		
3		0.0%		Total Number of Dominant Species Across All Strata: 2 (B)
4	_	0.0%		
5	0	0.0%		Percent of dominant Species
6		0.0%		That Are OBL, FACW, or FAC:100.0% (A/B)
7		0.0%		Prevalence Index worksheet:
8.	_	0.0%		Total % Cover of: Multiply by:
		= Total Cover		0BL species 10 x 1 = 10
Sapling-Sapling/Shrub Stratum (Plot size: 15')				FACW species 20 x 2 = 40
1	0	0.0%		FAC species 50 x 3 = 150
2	0			
3	0	0.0%		
4	0	0.0%		UPL speci es $0 \times 5 = 0$
5	0	0.0%		Column Totals: 95 (A) 260 (B)
6	0	0.0%		Prevalence Index = B/A = 2.737_
7	0	0.0%		Hydrophytic Vegetation Indicators:
8	0	0.0%		Rapid Test for Hydrophytic Vegetation
9	0	0.0%		✓ Dominance Test is > 50%
10	0	0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')		= Total Cover		Morphological Adaptations ¹ (Provide supporting
1	0	0.0%		data in Remarks or on a separate sheet)
2.		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
3.	0	0.0%		¹ Indicators of hydric soil and wetland hydrology must
4	0	0.0%		be present, unless disturbed or problematic.
5.		0.0%		Definition of Vegetation Strata:
6.		0.0%		Four Vegetation Strata:
7	0	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
Herb Stratum (Plot size: _5')	0 :	= Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	40	✓ 42.1%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding
1. Juncus tenuis				vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Persicaria pensylvanica		\Box	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Glechoma hederacea	<u>15</u> 10	15.8%	FACU FAC	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Microstegium vimineum		\Box		in height.
5. Lycopus uniflorus		10.5%	OBL	
6		0.0%		Five Vegetation Strata:
7		0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		0.0%		Sapling stratum – Consists of woody plants, excluding woody
10	0	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
11	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
12	0			vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	95=	= Total Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0	0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0	0.0%		m) in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%		Hudosahadia
6	0	0.0%	- — —	Hydrophytic Vegetation
	0	= Total Cover		Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is significantly disturbed due to periodic mowing. It is suspected that should periodic disturbance cease to occur that hydrophytic vegetation would more prominently dominate the wetland system.

Soil Sampling Point: EX3-SPW

Profile Descr	iption: (Describe to t	he depth i	needed to document	the indic	ator or co	nfirm the a	bsence of indicators.)	
Depth	Matrix		Re	dox Featu				
(inches)	Color (moist)		Color (moist)	%	Type	Loc2	Texture	Remarks
0-6	black						sand	
							-	
							-	
				-				
	· · · · · · · · · · · · · · · · · · ·	ı. RM=Redu	ced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=	Matrix
Hydric Soil							Indicators for Prob	lematic Hydric Soils ³ :
Histosol (•		Dark Surface (•			2 cm Muck (A10)) (MLRA 147)
_	pedon (A2)		Polyvalue Belov				Coast Prairie Re	
Black His	tic (A3)		Thin Dark Surfa	ace (S9) (N	/ILRA 147, 1	48)	(MLRA 147,148)	
Hydroger	Sulfide (A4)		Loamy Gleyed	Matrix (F2))		Piedmont Flood	olain Soils (F19)
Stratified	Layers (A5)		Depleted Matri:	x (F3)			(MLRA 136, 147	
2 cm Muc	k (A10) (LRR N)		Redox Dark Su	rface (F6)			Very Shallow Da	ark Surface (TF12)
Depleted	Below Dark Surface (A1	1)	Depleted Dark	Surface (F	7)		✓ Other (Explain i	
☐ Thick Dar	k Surface (A12)		Redox Depress	ions (F8)			E outer (Explain)	. Hemane,
Sandy Mu	ıck Mineral (S1) (LRR N,		☐ Iron-Manganes	e Masses ((F12) (LRR i	٧,		
MLRA 14	7, 148)		MLRA 136)					
Sandy Gl	eyed Matrix (S4)		Umbric Surface	e (F13) (ML	_RA 136, 12	2)	3	
Sandy Re	dox (S5)		Piedmont Floor	dplain Soils	(F19) (MLF	RA 148)	Indicators o	f hydrophytic vegetation and ydrology must be present,
Stripped	Matrix (S6)		Red Parent Ma	terial (F21)) (MLRA 127	7, 147)		disturbed or problematic.
	ayer (if observed):							
	omnacted soils/arave	·I					Hydric Soil Present?	Yes ● No ○
Depth (inc	hes):_6						nyunc son Present?	res © No C
Remarks:								
According to		jional Sup _l	plement, soils of new					e presence of wetland hydrology

Project/Site: Birdsboro Pov	ver LLC		City/County: Exeter Twp	o./Berks Co.	Sampling	Date: 22-Sep-16
Applicant/Owner: Birdsbore	o Power, LLC		State	PA PA	Sampling Point	EX3-SPU
Investigator(s): KR, JY			Section, Township, Rang	ge: S	т	R
Landform (hillslope, terrace	, etc.): floodplain/	terrace	Local relief (concave, conv	vex, none):	flat S	Slope: <u>1.0%</u> / <u>0.6</u> °
Subregion (LRR or MLRA):	MLRA 148 in LRR S	Lat.:	40.276351	Long.: -75	.837850	Datum: NAD 83
Soil Map Unit Name: Gibra	altar silt loam (Gc)			NV	VI classification:	UPL
Are climatic/hydrologic con		ical for this time of ve	ear? Yes • No O (If no, explain	_	
_	il 🗹 , or Hydrolo		`	• •	tances" present?	Yes ○ No •
Are Vegetation \square , So					ny answers in Rem	
Summary of Finding	gs - Attach site	map showing s	ampling point loca	tions, trai	nsects, impor	tant features, etc.
Hydrophytic Vegetation Pr	esent? Yes	No 💿				
Hydric Soil Present?	Yes 🔾	No •	Is the Sampled A	rea Yes	No 🗨	
Wetland Hydrology Presen	t? Yes 🔾	No •	within a Wetland	l? les 🥹	NO C	
Remarks:						
			ary line right-of-way. Vege to previous construction ac			
Hydrology						
Wetland Hydrology Indica	tors:			Seconda	ıry Indicators (minimu	um of two required)
Primary Indicators (minim	num of one required;	check all that apply)			ace Soil Cracks (B6)	in or two regained,
Surface Water (A1)		True Aquatic Plant	s (B14)	Spar	sely Vegetated Conca	ave Surface (B8)
High Water Table (A2)		Hydrogen Sulfide (Odor (C1)	Drai	nage Patterns (B10)	
Saturation (A3)		Oxidized Rhizospho	eres along Living Roots (C3)		s Trim Lines (B16)	
Water Marks (B1)		Presence of Reduc	ed Iron (C4)	Dry	Season Water Table ((C2)
Sediment Deposits (B2)		Recent Iron Reduc	tion in Tilled Soils (C6)	Cray	rfish Burrows (C8)	
Drift deposits (B3)		Thin Muck Surface	(C7)	Satu	ration Visible on Aeria	al Imagery (C9)
Algal Mat or Crust (B4)		Other (Explain in R	Remarks)	Stur	ited or Stressed Plant	s (D1)
Iron Deposits (B5)				✓ Geo	morphic Position (D2)	ı
Inundation Visible on Aer	0 3			L Shal	low Aquitard (D3)	
Water-Stained Leaves (B9	9)			Micr	otopographic Relief (I	D4)
Aquatic Fauna (B13)				L FAC	-neutral Test (D5)	
Field Observations:	Yes ○ No •	5 " " \				
Surface Water Present?		Depth (inches):				
Water Table Present?	Yes ○ No •	Depth (inches):	Wetland	l Hydrology Pr	esent? Yes	No •
Saturation Present? (includes capillary fringe)	Yes O No 💿	Depth (inches):		i nyurology Pi	esentr 163 C	110 0
Describe Recorded Data (s	stream gauge, monito	ring well, aerial photo	os, previous inspections), if	f available:		
Remarks:						
The Geomorphic Position I	nydrology indicator is	applicable to this sam	nnle plot due to its location	n within the fl	oodplain of the Sch	nuvlkill River However
no other hydrology indicat	, ,,	· ·	1 1 '		ocupiani or the con	ayıkın raver. Hewever,

		—Species? —		Sampling Point: <u>EX3-SPU</u>
	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover		Status	
		0.004		Number of Dominant Species
1				That are OBL, FACW, or FAC:1(A)
2	0	0.0%		TIME IN CO. 1991
3	0	0.0%		Total Number of Dominant Species Across All Strata: 3 (B)
	_	0.0%		Species Actoss All Strata.
4				Percent of dominant Species
5	0	0.0%		That Are OBL, FACW, or FAC: 33.3% (A/B)
6	0	0.0%		That Are OBL, FACW, OF FAC.
7		0.0%		Prevalence Index worksheet:
	_	0.0%		
8				
Dlot size	0	= Total Cover		0BL speci es0 x 1 =0
Sapling-Sapling/Shrub Stratum (Plot size:)			FACW species5 x 2 =10
1	0	0.0%		I
2.	0	0.0%		FAC species $\underline{15}$ x 3 = $\underline{45}$
		0.0%		FACU species <u>60</u> x 4 = <u>240</u>
3	_			UPL species $0 \times 5 = 0$
4	0	0.0%		·
5	0	0.0%		Column Totals: <u>80</u> (A) <u>295</u> (B)
6.	0	0.0%		Prevalence Index = B/A = 3.688
		0.0%		Trevalence mack - B/A - 3.000
7				Hydrophytic Vegetation Indicators:
8	0			Rapid Test for Hydrophytic Vegetation
9.	0	0.0%		Dominance Test is > 50%
10	0	0.0%		<u> </u>
10				Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')	0	= Total Cover		Morphological Adaptations ¹ (Provide supporting
1. Rosa multiflora	10	✓ 100.0%	FACU	data in Remarks or on a separate sheet)
		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2				
3	0	0.0%		Indicators of hydric soil and wetland hydrology must
4	0_	0.0%		be present, unless disturbed or problematic.
5		0.0%		Definition of Vegetation Strata:
				Four Vegetation Strata:
6	0			Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0	0.0%		(7.6 cm) or more in diameter at breast height (DBH),
_Herb Stratum (Plot size: _5')	10	= Total Cover		regardless of height.
				Sapling/shrub stratum – Consists of woody plants, excluding
1. Glechoma hederacea	40	57.1%	FACU	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Panicum virgatum	15	✓ 21.4%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Parthenocissus quinquefolia	5	7.1%	FACU	regardless of size, and all other plants less than 3.28 ft tall.
		7.1%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Persicaria pensylvanica		\Box		in height.
5. Oxalis stricta	5		FACU	
6	0	0.0%		Five Vegetation Strata:
7	0	0.0%		
		0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8				ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9	0	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10	0	0.0%		vines, approximately 20 ft (6 m) or more in height and less
	0	0.0%		than 3 in. (7.6 cm) DBH.
11				Shrub stratum – Consists of woody plants, excluding woody
12	0	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	70	= Total Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
	0	0.0%		including herbaceous vines, regardless of size, and woody
1				species, except woody vines, less than approximately 3 ft (1
2	0			m) in height.
3	0_	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5				Hydrophytic
6	0	0.0%		Vegetation V A
	0	= Total Cover		Present? Yes No No
				I
Remarks: (Include photo numbers here or on a separate shee	et.)			
Vegetation is significantly disturbed due to periodic mowing.				

Soil Sampling Point: EX3-SPU

Profile Descr	iption: (Describe to t	the depth ne	eded to document	the indica	ator or co	nfirm the a	absence of indicators.)	
Depth	Matrix		Re	dox Featu				
(inches)	Color (moist)	<u></u> %	Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks
0-4	black						sand	
						-		
							-	
¹ Type: C=Cond	centration. D=Depletion	n. RM=Reduce	d Matrix, CS=Covere	ed or Coate	d Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=Ma	atrix
Hydric Soil I			<u> </u>					
Histosol (Dark Surface (S7)			Indicators for Proble	
	pedon (A2)		Polyvalue Belo		S8) (MI DA	147 149\	2 cm Muck (A10)	(MLRA 147)
Black Hist			Thin Dark Surfa				Coast Prairie Redo	x (A16)
	Sulfide (A4)				LIXA 147,	140)	(MLRA 147,148)	
	Layers (A5)		Loamy Gleyed				Piedmont Floodpla	ain Soils (F19)
_			Depleted Matri				(MLRA 136, 147)	
	k (A10) (LRR N)		Redox Dark Su				Very Shallow Dark	
	Below Dark Surface (A1	11)	Depleted Dark)		Other (Explain in I	Remarks)
Thick Dar	k Surface (A12)		Redox Depress					
Sandy Mu MLRA 147	ck Mineral (S1) (LRR N, 7, 148)	ı	Iron-Manganes MLRA 136)					
Sandy Gle	eyed Matrix (S4)		Umbric Surface	e (F13) (ML	RA 136, 12	22)	3	
Sandy Re	dox (S5)		Piedmont Floo	dplain Soils	(F19) (ML	RA 148)	Indicators of f wetland hyd	nydrophytic vegetation and rology must be present,
Stripped M	Matrix (S6)		Red Parent Ma	terial (F21)	(MLRA 12	7, 147)		turbed or problematic.
Da atulativa I	(if abanuad).							
	ayer (if observed):							
	ompacted soils/grave	<u> </u>					Hydric Soil Present?	Yes O No 💿
Depth (incl	nes): <u>4</u>						,	105 0 110 0
Remarks:								
Soils within th	ne sample plot were	considered :	significantly distur	bed due t	o constru	ction activi	ities associated with a sa	nitary-line's right-of-way.
i								

Project/Site: Birdsboro Power LLC	City/C	ounty: Exeter Twp./Berks	Co. Sampling Date:	11-Aug-16
Applicant/Owner: Birdsboro Power, LLC		State: PA	Sampling Point:	FI1-SPW
Investigator(s): KR, JY	Section	on, Township, Range: S	T R	
Landform (hillslope, terrace, etc.): ba	asin Local re	elief (concave, convex, no	ne): concave Slope:	0.0% / _{0.0} °
Subregion (LRR or MLRA): MLRA 148	in LRR S Lat.: 40.277	'361 Long		Datum: NAD 83
Soil Map Unit Name: Gibraltar silt loam			NWI classification: PEM	
Are climatic/hydrologic conditions on the		'es No (If no, e	explain in Remarks.)	
		,		. ● No ○
			bir carristances present.	
Are Vegetation . , Soil . , o	r Hydrology 🔲 naturally problema	ntic? (If needed, ex	cplain any answers in Remarks.)	
Summary of Findings - Attac	ch site map showing sampli	ng point locations	s, transects, important	features, etc.
Hydrophytic Vegetation Present? Y	es No			
	es No	Is the Sampled Area		
-	res No	within a Wetland?	∕es • No ○	
Remarks:				
Hydrology				
Wetland Hydrology Indicators:	aminada abada all that anni N	<u>.</u> ;	Secondary Indicators (minimum of ty	vo required)
Primary Indicators (minimum of one re	equired; cneck all that apply) True Aquatic Plants (B14)		Surface Soil Cracks (B6)	food (DO)
High Water Table (A2)	Hydrogen Sulfide Odor (C1)		Sparsely Vegetated Concave SurfDrainage Patterns (B10)	race (B8)
Saturation (A3)	Oxidized Rhizospheres along	-	Moss Trim Lines (B16)	
Water Marks (B1)	Presence of Reduced Iron (Dry Season Water Table (C2)	
✓ Sediment Deposits (B2)	Recent Iron Reduction in Til		Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Thin Muck Surface (C7)		Saturation Visible on Aerial Imag	ery (C9)
Algal Mat or Crust (B4)	Other (Explain in Remarks)		Stunted or Stressed Plants (D1)	
Iron Deposits (B5)		[•	Geomorphic Position (D2)	
Inundation Visible on Aerial Imagery (B	7)	[•	✓ Shallow Aquitard (D3)	
✓ Water-Stained Leaves (B9)			Microtopographic Relief (D4)	
Aquatic Fauna (B13)			FAC-neutral Test (D5)	
Field Observations: Surface Water Present? Yes	No Depth (inches): 4			
		<u>· </u>		
		Wetland Hydro	ology Present? Yes • No	\circ
(includes capillary fringe) Yes	No Depth (inches): 0			
Describe Recorded Data (stream gauge	e, monitoring well, aerial photos, previo	ous inspections), if availa	ble:	
Remarks:				

		Dom	.:		Sampling Point: <u>FI1-SPW</u>
Tree Stratum (Plot size:)	Absolute % Cover	Rel.9		Indicator Status	
1	0		0.0%		Number of Dominant Species That are OBL, FACW, or FAC: (A)
2		\square _	0.0%		Total Number of Dominant
3	0	\sqcup _	0.0%		Species Across All Strata:
4	0	\sqcup _	0.0%		
5	0	\sqcup _	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC:100.0% (A/B)
6	0	\sqcup _	0.0%		That are obe, racw, or rac.
7	0	\sqcup _	0.0%		Prevalence Index worksheet:
8	0	\sqcup _	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:) =	= Tota	l Cover		0BL speciles <u>30</u> x 1 = <u>30</u>
1			0.0%		FACW species <u>20</u> x 2 = <u>40</u>
2			0.0%		FAC species15 x 3 =45
3.			0.0%		FACU species x 4 =0
4			0.0%		UPL speci es $0 \times 5 = 0$
5			0.0%		Column Totals: <u>65</u> (A) <u>115</u> (B)
6			0.0%		Prevalence Index = B/A = 1.769
7	0		0.0%		Hydrophytic Vegetation Indicators:
8	0		0.0%		Rapid Test for Hydrophytic Vegetation
9			0.0%		✓ Dominance Test is > 50%
0			0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		= Tota	l Cover		
	0	П	0.0%		Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1 2			0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
3.			0.0%		¹ Indicators of hydric soil and wetland hydrology must
3 4		$\overline{-}$	0.0%		be present, unless disturbed or problematic.
5		\neg	0.0%		Definition of Vegetation Strata:
6		$\overline{\Box}$	0.0%		Four Vegetation Strata:
7		$\overline{\Box}$	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
Herb Stratum (Plot size: 5')			l Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
4	20	✓ 3	30.8%	OBL	Sapling/shrub stratum – Consists of woody plants, excluding
1. Eleocharis palustris	20		30.8%	FACW	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Microstockum viminoum		=	15.4%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
Microstegium vimineum Persicaria hydropiper	5		7.7%	OBL	Woody vines – Consists of all woody vines greater than 3.28 ft
		\Box	7.7%	OBL	in height.
5. Lycopus americanus		$\overline{}$	7.7%	FAC	
6. Echinochioa crus-galli		\neg	0.0%	TAC	Five Vegetation Strata:
7		\neg	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		$\overline{-}$			ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		\neg	0.0%		Sapling stratum – Consists of woody plants, excluding woody
0		\neg	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1		\neg	0.0%		Shrub stratum – Consists of woody plants, excluding woody
2	0		0.0% I Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)					Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
1			0.0%		species, except woody vines, less than approximately 3 ft (1
2		$\overline{}$	0.0%		m) in height.
3			0.0%		Woody vines – Consists of all woody vines, regardless of height.
4			0.0%		
5			0.0%		Hydrophytic
6			0.0%		Vegetation
	0	= Tota	al Cove	•	

Soil Sampling Point: FI1-SPW

Profile Descr	iption: (De	escribe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators.)				
Depth		Matrix		Rec	lox Featu	ires						
(inches)	Color	(moist)	%	Color (moist)	%_	Tvpe 1	Loc²	<u>Texture</u>	Remarks			
0-3	10YR	3/1	100					Silty Clay				
3-8	7.5YR	4/4	100					Silty Clay				
	-											
	-	-	-									
	-	_	-		-							
					-			-				
1												
, ·		•	on. RM=Red	uced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=Ma	atrix			
Hydric Soil I								Indicators for Proble	matic Hydric Soils ³ :			
Histosol (•			Dark Surface (S		(00) (11) 01		2 cm Muck (A10)	(MLRA 147)			
Black Hist	pedon (A2)			Polyvalue Belov				Coast Prairie Redo	ox (A16)			
	Sulfide (A4)		☐ Thin Dark Surfa☐ Loamy Gleyed I			48)	(MLRA 147,148)	ļ			
	Layers (A5)			Depleted Matrix)		Piedmont Floodpla (MLRA 136, 147)	ain Soils (F19)			
2 cm Muck (A10) (LRR N) Redox Dark Surface (F6)							Very Shallow Dark	Curface (TE12)				
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7)												
	k Surface (A		,	Redox Depress		,		✓ Other (Explain in Remarks)				
	ck Mineral (•	٧.	☐ Iron-Manganes	e Masses ((F12) (LRR I	٧,					
MLRA 147			•	MLRA 136)								
Sandy Gle	eyed Matrix	(S4)		Umbric Surface				³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
Sandy Red				☐ Piedmont Flood	dplain Soils	s (F19) (MLF	RA 148)					
☐ Stripped N	Matrix (S6)			Red Parent Ma	terial (F21)) (MLRA 127	7, 147)	unless disturbed or problematic.				
Restrictive La	ayer (if ob	served):										
	ck hardna								!			
Depth (incl								Hydric Soil Present?	Yes ● No ○			
Remarks:												
Soils were co	nsidered h	vdric due	to the ab	undance of hydrology	and hvo	drophytic v	egetation	indicators				
00110 11010 001		.,	10 1110 42	andanes of nyareneg	, aa, c	opjo .	ogotatio	aioatoro.				
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Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Ber	rks Co. Sampling Date	: 11-Aug-16
Applicant/Owner: Birdsboro Power, L	LC	State: PA	Sampling Point:	FI1-SPU
Investigator(s): KR, JY		Section, Township, Range: S	5 T F	l
Landform (hillslope, terrace, etc.):	terrace/floodplain	Local relief (concave, convex,	none): CONVEX Slope:	
Subregion (LRR or MLRA): MLRA	148 in LRR S Lat.:	40.277003 Lo		Datum: NAD 83
Soil Map Unit Name: Gibraltar silt le		40.277003	NWI classification: UPL	<u> </u>
		ear? Yes No (If no		
Are climatic/hydrologic conditions of		•	o, explain in Remarks.)	s ● No ○
Are Vegetation, Soil	, or Hydrology significant	ly disturbed? Are "Norma	nl Circumstances" present? Yes	S NO C
Are Vegetation , Soil ,	, , , ,	,	explain any answers in Remarks.)	
Summary of Findings - At	· · · · · · · · · · · · · · · · · · ·	ampling point location	ns, transects, important	features, etc.
Hydrophytic Vegetation Present?	Yes No •			
Hydric Soil Present?	Yes O No O	Is the Sampled Area	Yes ○ No •	
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?		
Hydrology				
Wetland Hydrology Indicators:			C	
Primary Indicators (minimum of or	ne required: check all that apply)		Secondary Indicators (minimum of to Surface Soil Cracks (B6)	wo required)
Surface Water (A1)	True Aquatic Plant	s (B14)	Sparsely Vegetated Concave Sur	face (B8)
High Water Table (A2)	Hydrogen Sulfide (Drainage Patterns (B10)	.400 (20)
Saturation (A3)		eres along Living Roots (C3)	Moss Trim Lines (B16)	
☐ Water Marks (B1)	Presence of Reduc	ed Iron (C4)	☐ Dry Season Water Table (C2)	
Sediment Deposits (B2)	Recent Iron Reduc	tion in Tilled Soils (C6)	Crayfish Burrows (C8)	
Drift deposits (B3)	☐ Thin Muck Surface	(C7)	Saturation Visible on Aerial Imag	ery (C9)
☐ Algal Mat or Crust (B4)	Other (Explain in R	Remarks)	Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	(7-7)		✓ Geomorphic Position (D2)	
Inundation Visible on Aerial Imager	y (B7)		☐ Shallow Aquitard (D3)	
Water-Stained Leaves (B9)☐ Aquatic Fauna (B13)			Microtopographic Relief (D4)	
			FAC-neutral Test (D5)	
Field Observations: Surface Water Present? Yes	No Depth (inches):			
Water Table Present? Yes				
Catamatica Danasata		Wetland Hyd	Irology Present? Yes \bigcirc No	o •
(includes capillary fringe) Yes	No Depth (inches):			
Describe Recorded Data (stream ga	auge, monitoring well, aerial photo	os, previous inspections), if ava	ilable:	
Remarks:				
The Geomorphic Position hydrology no other hydrology indicators were	, , , , , , , , , , , , , , , , , , , ,		thin the floodplain of the Schuylkill	River. However,
The other flydrology indicators were	observed during the neid investig	ation.		

			minant		Sampling Point: FI1-SPU
	Absolute % Cover	Re		Indicator Status	Dominance Test worksheet:
1. Liriodendron tulipifera	40	_ _	57.1%	FACU	Number of Dominant Species That are OBL, FACW, or FAC: (A)
2. Robinia pseudoacacia	20	V _	28.6%	FACU	T. IN I SP. III
3. Acer rubrum	10		14.3%	FAC	Total Number of Dominant Species Across All Strata: 5 (B)
4	0_		0.0%		
5			0.0%		Percent of dominant Species That Are OBL_FACW_or_FAC: 40.0% (A/B)
6	_		0.0%		That Are OBL, FACW, or FAC: 40.0% (A/B)
7	0		0.0%		Prevalence Index worksheet:
8	0		0.0%		Total % Cover of: Multiply by:
4-1	70	= To	tal Cover		OBL species 0 x 1 = 0
Sapling-Sapling/Shrub Stratum (Plot size: 15'					FACW species 0 x 2 = 0
1. Lindera benzoin	30	_ _	100.0%	FAC	FAC species 60 x 3 = 180
2	0	Ц_	0.0%		FACU species 105 x 4 = 420
3		\sqcup _	0.0%		· ·
4	0	Ц.	0.0%		
5	0	Щ_	0.0%		Column Totals: <u>165</u> (A) <u>600</u> (B)
6	0	Ш_	0.0%		Prevalence Index = B/A = 3.636
7	0		0.0%		Hydrophytic Vegetation Indicators:
8	0		0.0%		Rapid Test for Hydrophytic Vegetation
9	0		0.0%		Dominance Test is > 50%
10	0_		0.0%		Prevalence Index is ≤3.0 ¹
	30	= To	tal Cover		
	0		0.0%		Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1			0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2		<u> </u>	0.0%		
3		H-			Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		H-	0.0%		Definition of Vegetation Strata:
5		H-	0.0%		Four Vegetation Strata:
6		Н-	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0	Ш_	0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	0	= To	tal Cover		regardless of height.
1. Microstegium vimineum	20	_	30.8%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Ageratina altissima	20	V _	30.8%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Lonicera japonica	10		15.4%	FACU	regardless of size, and all other plants less than 3.28 ft tall.
4. Oxalis stricta	10		15.4%	FACU	Woody vines – Consists of all woody vines greater than 3.28 ft
5. Parthenocissus quinquefolia	5		7.7%	FACU	in height.
6	0		0.0%		Eive Vegetation Strate
7	0		0.0%		Five Vegetation Strata:
8	_		0.0%		Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9	0		0.0%		diameter at breast height (DBH).
7:		$\overline{\Box}$	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10 11	0		0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
12.	0		0.0%		Shrub stratum – Consists of woody plants, excluding woody
	65	 = Tot	tal Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.
					Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
1	0	Ш_	0.0%		species, except woody vines, less than approximately 3 ft (1
2	0	Ш_	0.0%		m) in height.
3	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4	0		0.0%		height.
5	_		0.0%		Hydronhytic
6.	0		0.0%		Hydrophytic Vegetation
	0	= To	tal Cove	r	Present? Yes No •
Remarks: (Include photo numbers here or on a separate shee					<u> </u>
no hydrophytic vegetation indicators observed	su. <i>)</i>				
no nyarophytic vegetation indicators observed					

Soil Sampling Point: FI1-SPU

Profile Descr	iption: (Describe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators.)				
Depth	Matrix		Red	ox Featu							
(inches)	Color (moist)	%	Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks			
0-8	10YR 3/2	100					Sandy Loam				
8-16	black	100					Sand				
							-				
				-			-				
¹ Type: C=Cond	centration. D=Depletio	n. RM=Redu	uced Matrix, CS=Covere	d or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=Ma	atrix			
Hydric Soil I	ndicators:						Indicators for Proble	ematic Hydric Soils ³ :			
Histosol (A1)		Dark Surface (S	7)				•			
Histic Epip	pedon (A2)		Polyvalue Below	/ Surface	(S8) (MLRA	147,148)	2 cm Muck (A10)				
☐ Black Hist	ic (A3)		☐ Thin Dark Surfa	ce (S9) (N	/ILRA 147, 1	48)	Coast Prairie Redo (MLRA 147,148)	ox (A16)			
Hydrogen	Sulfide (A4)		Loamy Gleyed N	/latrix (F2))		Piedmont Floodpla	ain Soils (E10)			
Stratified	Layers (A5)		Depleted Matrix	(F3)			(MLRA 136, 147)	uii Jolis (i 17)			
2 cm Mucl	k (A10) (LRR N)		Redox Dark Sur	face (F6)			Very Shallow Dark	Surface (TF12)			
Depleted	Below Dark Surface (A	11)	Depleted Dark S	Surface (F	7)		Other (Explain in F	Remarks)			
☐ Thick Dar	k Surface (A12)		Redox Depressi								
	Sandy Muck Mineral (S1) (LRR N, MLRA 147, 148) Sandy Muck Mineral (S1) (LRR N, MLRA 136)				٧,						
Sandy Gle	yed Matrix (S4)		Umbric Surface	(F13) (MI	_RA 136, 12	2)	2				
Sandy Re	dox (S5)		Piedmont Flood	plain Soils	(F19) (MLF	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
Stripped N	Matrix (S6)		Red Parent Mat	erial (F21)) (MLRA 127	7, 147)		sturbed or problematic.			
Postrictivo I	ayer (if observed):										
Type:	ayer (ii observeu).										
Depth (incl	hes).						Hydric Soil Present?	Yes O No 💿			
•	163)										
Remarks:											
no hydric soil	indicators observed	1									

Project/Site: Birdsboro Power LLC	City/County: Exeter Twp./Berks Co. Sampling Date: 22-Sep-16
Applicant/Owner: Birdsboro Power, LLC	State: PA Sampling Point: LI1-SPW
Investigator(s): KR, JY	Section, Township, Range: S T R
Landform (hillslope, terrace, etc.): Undulating	Local relief (concave, convex, none): Concave Slope: 0.0% / 0.0 °
Subregion (LRR or MLRA): MLRA 148 in LRR S Lat.:	40.278577 Long.: -75.831770 Datum: NAD 83
Soil Map Unit Name: Raritan silt loam (RaB)	NWI classification: PSS
Are climatic/hydrologic conditions on the site typical for this time of ye	
	, , , , , , , , , , , , , , , , , , , ,
	, and the manufactured present.
	roblematic? (If needed, explain any answers in Remarks.) ampling point locations, transects, important features, etc.
	unipining point rocations, transects, important reatures, etc.
, , , , , , , , , , , , , , , , , , ,	
V (A) N- (Is the Sampled Area within a Wetland?
Wetland Hydrology Present? Yes NO NO Remarks:	
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)
Surface Water (A1)	
☐ High Water Table (A2) ☐ Hydrogen Sulfide (
Saturation (A3) Oxidized Rhizosphe	eres along Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduc	ed Iron (C4) Dry Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduc	tion in Tilled Soils (C6) Crayfish Burrows (C8)
Drift deposits (B3)	(C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in R	·
Iron Deposits (B5)	✓ Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9) Aquatic Fauna (B13)	Microtopographic Relief (D4)
Field Observations:	FAC-neutral Test (D5)
Surface Water Present? Yes No Depth (inches):	
Water Table Present? Yes No Depth (inches):	
Saturation Present?	Wetland Hydrology Present? Yes ● No ○
(includes capillary ininge)	
Describe Recorded Data (stream gauge, monitoring well, aerial photo	s, previous inspections), if available:
Remarks:	
Remarks.	

		C	!7		Sampling Point: <u>LI1-SPW</u>
Tree Stratum (Plot size:)	Absolute % Cover	Re		Indicator Status	Dominance Test worksheet:
1	0		0.0%		Number of Dominant Species That are OBL, FACW, or FAC:3(A)
2	0	\sqcup	0.0%		Total Number of Dominant
3	0	\sqcup	0.0%		Species Across All Strata:5(B)
4		\sqcup	0.0%		
5	0		0.0%		Percent of dominant Species That Are OBL, FACW, or FAC:60.0% (A/B)
6	0		0.0%		That Are OBL, FACW, or FAC.
7	0	\square	0.0%		Prevalence Index worksheet:
8	0		0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size: 15'	,0 =	= To	tal Cover		0BL speci es0 x 1 =0
	40	✓	100.0%	FACW	FACW species <u>40</u> x 2 = <u>80</u>
1. Acer saccharinum		_	0.0%	FACVV	FAC speci es <u>60</u> x 3 = <u>180</u>
2		Η-	0.0%		FACU species 35 x 4 = 140
3		Η-			UPL speci es $0 \times 5 = 0$
4		Η-	0.0%		Column Total s: 135 (A) 400 (B)
5		Н-	0.0%		
6		H	0.0%		Prevalence Index = B/A = 2.963
7		Η-	0.0%		Hydrophytic Vegetation Indicators:
8		님-	0.0%		Rapid Test for Hydrophytic Vegetation
9		片-	0.0%		✓ Dominance Test is > 50%
0	0	Ш_	0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15')	40 :	= To	tal Cover		Morphological Adaptations ¹ (Provide supporting
1Rosa multiflora	10	v _	100.0%	FACU	data in Remarks or on a separate sheet)
2	0		0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3			0.0%		¹ Indicators of hydric soil and wetland hydrology must
4			0.0%		be present, unless disturbed or problematic.
5			0.0%		Definition of Vegetation Strata:
6.			0.0%		Four Vegetation Strata:
7			0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
Herb Stratum (Plot size: 5')		- To:	tal Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	40	✓	47.10/	FAC	Sapling/shrub stratum – Consists of woody plants, excluding
1. Euthamia graminifolia		<u> </u>	47.1%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Microstegium vimineum			23.5%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Glechoma hederacea		\	23.5% 5.9%	FACU	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Parthenocissus quinquefolia	5	Η-		FACU	in height.
5		H	0.0%		
6		H	0.0%		Five Vegetation Strata:
7		Η-	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		⊢-	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		Ц.	0.0%		Sapling stratum – Consists of woody plants, excluding woody
0		닏-	0.0%		vines, approximately 20 ft (6 m) or more in height and less
1	0	닖-	0.0%		than 3 in. (7.6 cm) DBH.
2	0	$\square_{\underline{}}$	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	85=	= To	tal Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0		0.0%		including herbaceous vines, regardless of size, and woody
2	0		0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
3	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4			0.0%		height.
			0.0%		
6.	0	\Box	0.0%		Hydrophytic Vegetation
U			tal Cove		Present? Yes No

Soil Sampling Point: LI1-SPW

Profile Descri	iption: (De	escribe to	the depth	needed to docume	nt the indi	cator or co	nfirm the a	absence of indicators.)			
Depth		Matrix			Redox Featu	ıres					
(inches)	Color	(moist)	%	Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks		
0-8	10YR	5/2	90	7.5YR 4/6	10	C	M	Silty Clay Loam			
8-16	2.5Y	6/6+	80					Silt Loam			
	10YR	5/3	20								
	-						-				
								-			
		_									
		-									
¹ Type: C=Cond	centration.	D=Depletio	n. RM=Red	uced Matrix, CS=Cov	ered or Coat	ed Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=Ma	atrix		
Hydric Soil I								-			
Histosol (A		•		Dark Surface	(\$7)			Indicators for Proble	-		
Histic Epip	,			Polyvalue Be		(S8) (MI RA	147 148)	2 cm Muck (A10)	(MLRA 147)		
Black Histi				Thin Dark Su				Coast Prairie Redo	ox (A16)		
	Sulfide (A4)		Loamy Gleye			40)	(MLRA 147,148)			
	Layers (A5)			✓ Depleted Ma		,		Piedmont Floodpla (MLRA 136, 147)	ain Soils (F19)		
	k (A10) (LR			Redox Dark			(MLRA 136, 147) Very Shallow Dark Surface (TF12)				
	Below Dark		.11)	Depleted Da	` '	7)		_			
	k Surface (A	•		Redox Depre	•	-,		Uther (Explain in Remarks)			
	ck Mineral (•	N.	☐ Iron-Mangar		(F12) (LRR	N,				
MLRA 147	', 148)	(31) (LKK I	ν,	MLRA 136)		. , .	•				
Sandy Gle	yed Matrix	(S4)		Umbric Surfa	ace (F13) (M	LRA 136, 12	22)	2			
Sandy Red	dox (S5)			Piedmont Flo	oodplain Soils	s (F19) (MLI	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,			
Stripped N	Natrix (S6)			Red Parent I	Material (F21) (MLRA 12	7, 147)		sturbed or problematic.		
Restrictive La	ayer (if ob	served):									
Type:								Hydric Soil Present?	Yes ● No ○		
Depth (inch	nes):							Tryunc Son Fresent:	res © NO ©		
Remarks:											

Project/Site: Birdsboro Power	LLC	City/County: Exeter Twp./Ber	ks Co. Sampling Date: 22-Sep-16
Applicant/Owner: Birdsboro Po	ower, LLC	State: PA	Sampling Point: LI1-SPU
Investigator(s): KR, JY		Section, Township, Range: S	т R
Landform (hillslope, terrace, et	:c.): Undulating	Local relief (concave, convex,	none): flat Slope:0.0% /0.0 \
Subregion (LRR or MLRA):	MLRA 148 in LRR S		ng.: -75.831398
Soil Map Unit Name: Raritan		10.270200	NWI classification: UPL
	ons on the site typical for this time	of vear? Yes No (If no	o, explain in Remarks.)
Are Vegetation $oxedsymbol{\square}$, Soil			I Circumstances" present? Yes No
Are Vegetation , Soil		-	explain any answers in Remarks.)
Summary of Findings	- Attach site map showin		ns, transects, important features, etc.
Hydrophytic Vegetation Prese	ent? Yes O No 💿		
Hydric Soil Present?	Yes ○ No •	Is the Sampled Area	Yes ○ No ●
Wetland Hydrology Present?	Yes ○ No •	within a Wetland?	res C INU C
Hadrala m			
Hydrology			
Wetland Hydrology Indicators			Secondary Indicators (minimum of two required)
	n of one required; check all that app		Surface Soil Cracks (B6)
Surface Water (A1) High Water Table (A2)	☐ True Aquatic		Sparsely Vegetated Concave Surface (B8)
Saturation (A3)	_ , ,	fide Odor (C1) ospheres along Living Roots (C3)	☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16)
Water Marks (B1)		reduced Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)		reduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	Thin Muck Su	` '	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain	n in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)			Geomorphic Position (D2)
Inundation Visible on Aerial I	magery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13) Field Observations:			FAC-neutral Test (D5)
Surface Water Present?	res O No O Depth (inch	es):	
	'es ○ No • Depth (inch		
		Wetland Hyd	rology Present? Yes O No 💿
(includes capillary fringe)	'es No Depth (inch		
Describe Recorded Data (stre	am gauge, monitoring well, aerial p	hotos, previous inspections), if ava	ilable:
Domarko			
Remarks: no hydrology indicators were	observed		
The flydrology flidicators were	observed		

	Sampling Point: <u>LI1-5PU</u>			
	Absolute			Dominance Test worksheet:
Tree Stratum (Plot size: 30'	% Cover	Cover	Status	Number of Deminent Cooles
1. Quercus rubra	50	100.0%	6 FACU	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
2		0.0%		
				Total Number of Dominant
3				Species Across All Strata:5(B)
4	0	0.0%		
5	0	0.0%		Percent of dominant Species That Are ORL FACW or FAC: 40.0% (A/B)
6		0.0%		That Are OBL, FACW, or FAC: 40.0% (A/B)
7		0.0%		Prevalence Index worksheet:
	_	0.0%		Total % Cover of: Multiply by:
8				
Sapling-Sapling/Shrub Stratum (Plot size: 15'	50	= Total Cov	er	0BL speci es x 1 =0
Supring Supring/Sirub Strutum	_	✓ 41.7%	E40	FACW species
1. Acer negundo				FAC speci es55 x 3 =165
2. Quercus rubra	5	41.7%	FACU	<u> </u>
3. Pinus sylvestris	2	16.7%	UPL	1
4	0	0.0%		UPL speci es $\frac{2}{}$ x 5 = $\frac{10}{}$
5	_	0.0%		Column Totals: 182 (A) 655 (B)
6				Prevalence Index = B/A = 3.599
7	0			Hydrophytic Vegetation Indicators:
8	0	0.0%		Rapid Test for Hydrophytic Vegetation
9.	0	0.0%		
		0.0%		Dominance Test is > 50%
10				Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)	12	= Total Cov	er	Morphological Adaptations ¹ (Provide supporting
1	0	0.0%		data in Remarks or on a separate sheet)
2.		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
		0.0%		¹ Indicators of hydric soil and wetland hydrology must
3				be present, unless disturbed or problematic.
4	0			
5	0	0.0%		Definition of Vegetation Strata:
6	0	0.0%		Four Vegetation Strata:
7		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
		= Total Cov	or	(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Herb Stratum (Plot size: _5')		_ 10ta1 cov	Ci	Sapling/shrub stratum – Consists of woody plants, excluding
1. Dactylis glomerata	60	✓ 50.0%	FACU	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Campsis radicans	50	✓ 41.7%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Solidago gigantea	10	8.3%	FACW	regardless of size, and all other plants less than 3.28 ft tall.
	0	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
4				in height.
5	0			
6	0	0.0%		Five Vegetation Strata:
7	0	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9		0.0%		diameter at breast height (DBH).
				Sapling stratum – Consists of woody plants, excluding woody
10				vines, approximately 20 ft (6 m) or more in height and less
11	0	0.0%		than 3 in. (7.6 cm) DBH.
12	0_	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Was to Vine Charles (Diet size:	120	= Total Cov	er	, , , ,
Woody Vine Stratum (Plot size:)				Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
1	0			species, except woody vines, less than approximately 3 ft (1
2	0	0.0%		m) in height.
3	0_	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
		0.0%		
5				Hydrophytic
6	0	0.0%		Vegetation
	0	= Total Cov	er	Present? Yes V NO S
Remarks: (Include photo numbers here or on a separate shee	ot.)			
no hydrophytic vegetation indicators observed	,			
no nyaropnyho vogotahon indicators observed				

Soil Sampling Point: LI1-SPU

Profile Descri	ption: (Describe to	the depth ne	eded to document	the indica	ator or co	nfirm the a	absence of indicators.)	
Depth	Matrix		Rec	dox Featu	res			
(inches)	Color (moist)		Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks
0-8	10YR 4/4	100					Silt Loam	
			-		-			
						-		
							-	
¹ Type: C=Cond	centration. D=Depletion	n. RM=Reduce	d Matrix, CS=Covere	ed or Coate	d Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=Mati	rix
Hydric Soil I	ndicators:						Indicators for Problem	natic Hydric Soils ³ :
Histosol (A	A1)		Dark Surface (S7)			2 cm Muck (A10) (N	
Histic Epip	edon (A2)		Polyvalue Belov	v Surface (S8) (MLRA	147,148)		
☐ Black Histi	c (A3)		☐ Thin Dark Surfa	ace (S9) (M	LRA 147, 1	48)	Coast Prairie Redox (MLRA 147,148)	(A16)
Hydrogen	Sulfide (A4)		Loamy Gleyed	Matrix (F2)				C-11- (F10)
Stratified I	_ayers (A5)		Depleted Matrix	(F3)			Piedmont Floodplair (MLRA 136, 147)	1 SOIIS (F19)
2 cm Muck	(A10) (LRR N)		Redox Dark Su				Very Shallow Dark S	Surface (TF12)
	Below Dark Surface (A1	11)	Depleted Dark	Surface (F7)		Other (Explain in Re	
	Surface (A12)	,	Redox Depress	ions (F8)			U Other (Explain in Re	erial ks)
	ck Mineral (S1) (LRR N		Iron-Manganes	e Masses (F	12) (LRR	N,		
MLRA 147	, 148)	1	MLRA 136)					
Sandy Gle	yed Matrix (S4)		Umbric Surface	(F13) (ML	RA 136, 12	22)	3	
Sandy Red	dox (S5)		Piedmont Floor	dplain Soils	(F19) (MLI	RA 148)	Indicators of hy wetland hydro	drophytic vegetation and logy must be present,
Stripped N	Matrix (S6)		Red Parent Ma	terial (F21)	(MLRA 12	7, 147)		ribed or problematic.
Dantuintina I a	(if abanual).							
	yer (if observed):							
Type: <u>ar</u>							Hydric Soil Present?	Yes ○ No •
Depth (inch	nes): <u>8</u>						,	
Remarks:								
no hydric soil	indicators observed							

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./	Berks Co. Se	mpling Date: 13-Jul-16
pplicant/Owner: Birdsboro Power,	, LLC	State:	PA Sampling	Point: MB2-SPW
vestigator(s): KR, JY		Section, Township, Range	: S T	R
andform (hillslope, terrace, etc.):	lowland/floodplain	Local relief (concave, conve	ex, none): concave	Slope://
ubregion (LRR or MLRA): MLRA	A 148 in LRR S La	- a t.: 40.271863	Long.: -75.807556	Datum: NAD 83
oil Map Unit Name: Abbottstown			NWI classification	tion: PEM
re climatic/hydrologic conditions		f year? Yes No (If	no, explain in Remarks.	
		,	• •	, O 11 (a)
			mal Circumstances" pres	Julie.
re Vegetation , Soil	, or Hydrology 🔲 natural	ly problematic? (If neede	ed, explain any answers	in Remarks.)
Summary of Findings - A	ttach site map showing	g sampling point locati	ions, transects, ir	nportant features, etc.
Hydrophytic Vegetation Present?	Yes No			
Hydric Soil Present?	Yes No	Is the Sampled Are	ea Yes ● No ○	
Wetland Hydrology Present?	Yes No	within a Wetland?		
Hydrology				
Wetland Hydrology Indicators:			Secondary Indicators	(minimum of two required)
Primary Indicators (minimum of o			Surface Soil Crack	• ,
Surface Water (A1)	True Aquatic P			d Concave Surface (B8)
☐ High Water Table (A2) ✓ Saturation (A3)	✓ Hydrogen Sulfi		Drainage Patterns	
Water Marks (B1)		spheres along Living Roots (C3) educed Iron (C4)	✓ Moss Trim Lines (✓ Dry Season Water	•
Sediment Deposits (B2)		eduction in Tilled Soils (C6)	Crayfish Burrows	
Drift deposits (B3)	☐ Thin Muck Surf	• •		on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain	• •	Stunted or Stresse	
Iron Deposits (B5)	_	,	✓ Geomorphic Positi	on (D2)
Inundation Visible on Aerial Image	ery (B7)		Shallow Aquitard	(D3)
Water-Stained Leaves (B9)			Microtopographic	
Aquatic Fauna (B13)			FAC-neutral Test	(D5)
Field Observations: Surface Water Present? Yes	No Depth (inche	s): 2		
	· ·			
Water Table Present? Yes			lydrology Present?	Yes ● No ○
Saturation Present? (includes capillary fringe) Yes	No O Depth (inche:		.,	
Describe Recorded Data (stream of	gauge, monitoring well, aerial ph	notos, previous inspections), if a	available:	
Remarks:				

		-Species?	
(0)	Absolute	Rel.Strat. Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Cover Status	Number of Dominant Species
1			That are OBL, FACW, or FAC: (A)
2			Total Number of Dominant
3	0		Species Across All Strata:
4	0		
5	0	0.0%	Percent of dominant Species That Are OBL FACW or FAC: 100.0% (A/B)
6	0	0.0%	That Are OBL, FACW, or FAC: 100.0% (A/B)
7		0.0%	Prevalence Index worksheet:
8		0.0%	Total % Cover of: Multiply by:
(District o	,0 =	= Total Cover	0BL species40 x 1 =40
Sapling-Sapling/Shrub Stratum (Plot size:			FACW species 55 x 2 = 110
1	0	0.0%	FAC species5 x 3 =15
2			FACU species $0 \times 4 = 0$
3	0		
4	0		'
5	0		Column Totals: <u>100</u> (A) <u>165</u> (B)
6	0		Prevalence Index = B/A = <u>1.650</u>
7	0		Hydrophytic Vegetation Indicators:
8	0	0.0%	Rapid Test for Hydrophytic Vegetation
9	0	0.0%	✓ Dominance Test is > 50%
0	0	0.0%	✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		= Total Cover	Morphological Adaptations ¹ (Provide supporting
1	0	0.0%	data in Remarks or on a separate sheet)
2		0.0%	Problematic Hydrophytic Vegetation ¹ (Explain)
		0.0%	1 Indicators of hydric sail and watland hydrology must
3			Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		0.0%	Definition of Vegetation Strata:
5		0.0%	Definition of Vegetation Strata:
6			Four Vegetation Strata: Tree stratum – Consists of woody plants, excluding vines, 3 in.
7			(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: _5')	0 =	= Total Cover	regardless of height.
1. Glyceria grandis	35	✓ 33.3% OBL	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Phalaris arundinacea	25	✓ 23.8% FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Persicaria maculosa	15	14.3% FACW	regardless of size, and all other plants less than 3.28 ft tall.
4. Lysimachia nummularia	15	14.3% FACW	Woody vines – Consists of all woody vines greater than 3.28 ft
5. Persicaria hydropiper	5	4.8% OBL	in height.
6. Juncus tenuis	5	4.8% FAC	Five Vegetation Streets
7. Carex spp.		4.8% NI	Five Vegetation Strata:
8.		0.0%	Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9		0.0%	diameter at breast height (DBH).
		0.0%	Sapling stratum – Consists of woody plants, excluding woody
0		0.0%	vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1		0.0%	Shrub stratum – Consists of woody plants, excluding woody
2		= Total Cover	vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	105	- Total Covel	Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1
2	0	0.0%	m) in height.
3.	0	0.0%	Woody vines – Consists of all woody vines, regardless of
4		0.0%	height.
5	_	0.0%	Hardwoods at a
6.		0.0%	Hydrophytic Vegetation
0	0	= Total Cover	Present? Yes Vo V

Soil Sampling Point: MB2-SPW

Profile Descr	intion: (Describe to	the denth i	needed to document	the indi	cator or co	nfirm the a	absence of indicators.)	
	Matrix	ane depart.		lox Feat			absolice of marcacorsi,	
Depth (inches)	Color (moist)	%	Color (moist)	%	Type 1	Loc2	Texture	Remarks
0-8	5YR 4/2	97	5YR 5/6	3	C	M	Silty Clay	Kemarko
	- 172						- Sirty Glay	
							-	
1 Type: C=Con	rentration D=Depletion	n RM=Redu	ced Matrix CS=Covere	ed or Coat	ed Sand Gra	ins 21 oca	tion: PL=Pore Lining. M=M	atrix
• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	II. KW-KCGC	CCU Wattix, CS=COVCIC	or cour	Cu Sana Gra	III3 LOCA		
Hydric Soil I			□ n . o c	.=\			Indicators for Proble	ematic Hydric Soils ³ :
Histosol (·		Dark Surface (S	•			2 cm Muck (A10)	(MLRA 147)
	pedon (A2)		Polyvalue Belov				Coast Prairie Red	ov (A16)
■ Black Hist	ic (A3)		Thin Dark Surfa	ice (S9) (N	MLRA 147, 1	48)	(MLRA 147,148)	DX (A10)
✓ Hydrogen	Sulfide (A4)		Loamy Gleyed I	Matrix (F2)		Piedmont Floodpl	ain Saile (E10)
Stratified	Layers (A5)		Depleted Matrix	(F3)			(MLRA 136, 147)	airi 30iis (i 17)
2 cm Muc	k (A10) (LRR N)		Redox Dark Sur	face (F6)			Very Shallow Dar	k Surface (TE12)
	Below Dark Surface (A	11)	Depleted Dark		7)			
	k Surface (A12)	11)	Redox Depress		.,		Other (Explain in	Remarks)
	• ,		☐ Iron-Manganes		(E12) (LDD N	ı		
☐ Sandy Mu MLRA 147	ck Mineral (S1) (LRR N	,	MLRA 136)	e iviasses	(I IZ) (LKK I	ν,		
			Umbric Surface	(F13) (M	I RA 136 12	2)		
	eyed Matrix (S4)						³ Indicators of	hydrophytic vegetation and
Sandy Re			☐ Piedmont Flood				wetland hyd	Irology must be present,
	Matrix (S6)		Red Parent Ma	terial (F21) (MLRA 127	', 147)	unless di	sturbed or problematic.
Postrictivo I	ayer (if observed):							
Type: <u>rc</u>							Hydric Soil Present?	Yes ● No ○
Depth (inc	nes): <u>8''</u>						Tryune Son Tresent	les C NO C
Remarks:								

Project/Site: Birdsboro Powe	er LLC		City/County: Exeter T	wp./Berks Co.	Samp	ling Date: 13-Jul-16
Applicant/Owner: Birdsboro	Power, LLC		Sta	rte: PA	Sampling Po	oint: MB2-SPU
Investigator(s): KR, JY			Section, Township, Ra	nge: S	т	R
Landform (hillslope, terrace,	etc.): Terrace		Local relief (concave, co	onvex, none)	none	Slope: <u>0.0%</u> / <u>0.0</u> °
Subregion (LRR or MLRA):	MLRA 148 in LRR S	Lat.:	40.272059	Long.:	-75.808327	Datum: NAD 83
Soil Map Unit Name: Penn-	Klinesville channery	silt loams (PkD)			NWI classification	u: UPL
Are climatic/hydrologic cond	itions on the site typ	ical for this time of ye	ear? Yes No	(If no, expl	ain in Remarks.)	
Are Vegetation 🗸 , Soil					ımstances" presen	t? Yes O No 💿
Are Vegetation, Soil	, or Hydrolo				in any answers in F	
Summary of Finding	s - Attach site	map showing s	ampling point lo	cations, t	ransects, imp	ortant features, etc.
Hydrophytic Vegetation Pre		No 💿				
Hydric Soil Present?		No 💿	Is the Sampled		○ No ●	
Wetland Hydrology Present	_? Yes \bigcirc	No 💿	within a Wetla	nd?		
The sample plot is located	in an area that is an	indairy mowed - there	Tore, vegetation was con	isidered sign	inicantly distalbed.	
Hydrology						
Wetland Hydrology Indicate	ors:			Seco	ondary Indicators (mir	nimum of two required)
Primary Indicators (minimu	um of one required;				Surface Soil Cracks (B	·
Surface Water (A1)		True Aquatic Plants	• •		Sparsely Vegetated Co	
☐ High Water Table (A2)☐ Saturation (A3)		Hydrogen Sulfide C	, ,		Drainage Patterns (B1	
Water Marks (B1)		Presence of Reduc	eres along Living Roots (C3)		Moss Trim Lines (B16 Dry Season Water Tal	,
Sediment Deposits (B2)			tion in Tilled Soils (C6)		Crayfish Burrows (C8)	
Drift deposits (B3)		☐ Thin Muck Surface	• •		Saturation Visible on <i>I</i>	
☐ Algal Mat or Crust (B4)		Other (Explain in R	• •		Stunted or Stressed P	lants (D1)
Iron Deposits (B5)					Geomorphic Position	(D2)
Inundation Visible on Aeria	0 3				Shallow Aquitard (D3)	
Water-Stained Leaves (B9))				Microtopographic Reli	
Aquatic Fauna (B13)					FAC-neutral Test (D5)	
Field Observations: Surface Water Present?	Yes ○ No •	Depth (inches):				
Water Table Present?	Yes O No •	Depth (inches):				
Saturation Present?		, , ,	Wetla	nd Hydrolog	y Present? Yes	s ○ No •
(includes capillary fringe)	Yes O No O	Depth (inches):				
Describe Recorded Data (st	ream gauge, monito	ring well, aerial photo	s, previous inspections)	, if available:		
Domorko						
Remarks: no hydrology indicators wei	ro observed					
The flydrology indicators wer	re observed					

		—Species? —		Sampling Point: MB2-5PU
	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover		Status	
		0.004		Number of Dominant Species
1	0	0.0%		That are OBL, FACW, or FAC: (A)
2	0	0.0%		
3		0.0%		Total Number of Dominant
		0.0%		Species Across All Strata: (B)
4				Demonstration and Consider
5	0	0.0%		Percent of dominant Species That Are OBL_FACW_or_FAC: 0.0% (A/B)
6	0	0.0%		That Are OBL, FACW, or FAC: 0.0% (A/B)
		0.0%		Prevalence Index worksheet:
7				
8	0	0.0%		Total % Cover of: Multiply by:
	0	= Total Cover		0BL species0 _ x 1 =0
Sapling-Sapling/Shrub Stratum (Plot size:				FACW species
1	0	0.0%		
2		0.0%		FAC species x 3 = 0
				FACU species 25 x 4 = 100
3	0	0.0%		
4	0	0.0%		· ·
5.	0	0.0%		Column Total s: <u>50</u> (A) <u>225</u> (B)
<u> </u>				
6				Prevalence Index = B/A =4.500_
7	0	0.0%		Hydrophytic Vegetation Indicators:
8.	_	0.0%		
• •	_	0.0%		Rapid Test for Hydrophytic Vegetation
9				☐ Dominance Test is > 50%
10	0	0.0%		Prevalence Index is ≤3.0 ¹
		= Total Cover		Manufacture 1 (Bravida arrayanting
Shrub Stratum (Plot size:)				Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1	0	0.0%		l <u> </u>
2	0	0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3.		0.0%		1 Indicators of hydric soil and wetland hydrology must
				be present, unless disturbed or problematic.
4	0			
5	0	0.0%		Definition of Vegetation Strata:
6		0.0%		Four Vegetation Strata:
				Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0	0.0%		(7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: 5')	0	= Total Cover		regardless of height.
	25	✓ 41.7%	UPL	Sapling/shrub stratum – Consists of woody plants, excluding
1. Plantago lanceolata				vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Lotus corniculatus	25	✓ 41.7%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Poa spp.	10	16.7%	NI	regardless of size, and all other plants less than 3.28 ft tall.
4	0	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
		\neg		in height.
5	0			
6	0	0.0%		Five Vegetation Strata:
7	0	0.0%		
_		0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8				ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9	0	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10	0	0.0%		vines, approximately 20 ft (6 m) or more in height and less
	0	0.0%		than 3 in. (7.6 cm) DBH.
11				Shrub stratum – Consists of woody plants, excluding woody
12	0	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	60	= Total Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
	0	0.000		including herbaceous vines, regardless of size, and woody
1	0			species, except woody vines, less than approximately 3 ft (1
2	0	0.0%		m) in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
	0	0.0%		height.
4				
5	0	0.0%		Hydrophytic
6	0	0.0%		Vegetation
·	0			Present? Yes No •
		= Total Cover		
Remarks: (Include photo numbers here or on a separate shee	et.)	_		
no hydrophytic vegetation indicators observed	•			

Soil Sampling Point: MB2-SPU

Profile Descri	iption: (De	scribe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators	.)			
Depth	Matrix Redox Features							_				
(inches)	Color	(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	Texture	Rema			
0-6	10YR	4/6	100					Loam	resembles f			
	-								·			
					-		-					
	-	-										
		-	-			-	-	•				
1 Type: C=Cond	centration I	D=Depletio	n RM=Red	uced Matrix, CS=Covere	ed or Coate	ed Sand Gra	nins 2Loca	tion: PL=Pore Lining. M	l=Matrix			
Hydric Soil I			II. RWI-RCO	ucca Matrix, 05-00ver	or court	ca Sana Ore	iiii Loca			2		
Histosol (A				Dark Surface (\$	27)			Indicators for Pro	oblematic Hydric	Soils ³ :		
	pedon (A2)			Polyvalue Belov	,	(CO) (MI DA	147 140)	2 cm Muck (A	10) (MLRA 147)			
Black Histi				Thin Dark Surfa				Coast Prairie F				
	Sulfide (A4)		Loamy Gleyed			40)	(MLRA 147,14	18)			
_	Layers (A5))		Depleted Matrix		,			odplain Soils (F19)			
	k (A10) (LRI	D NI)		Redox Dark Su				(MLRA 136, 1	ŕ			
			11)	Depleted Dark		7)			Dark Surface (TF12)			
	Below Dark k Surface (A		11)	Redox Depress		,,		Other (Explain	n in Remarks)			
	•	•		☐ Iron-Manganes		(F12) (I RR	N					
MLRA 147	ck Mineral (7, 148)	S1) (LRR N	Ι,	MLRA 136)								
Sandy Gle	yed Matrix	(S4)		Umbric Surface	(F13) (MI	LRA 136, 12	22)	3	of hydrophytic veg	-4-4' d		
Sandy Red	dox (S5)			☐ Piedmont Floor	dplain Soils	(F19) (MLI	RA 148)	wetland	hydrology must be	present,		
Stripped N	Matrix (S6)			Red Parent Ma	terial (F21)) (MLRA 12	7, 147)		s disturbed or proble			
Restrictive La	aver (if ob	served):										
Type: _ro												
Depth (inch								Hydric Soil Present	t? Yes 🔾 I	No •		
Remarks:	,.											
	indicators	obsorios	1									
no hydric soil	indicators	observed	1									

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Berks C	Sampling Date: 10-Aug-16
Applicant/Owner: Birdsboro Power,	LLC	State: PA	Sampling Point: ME1-SPW
Investigator(s): KR, JY		Section, Township, Range: S	T R
Landform (hillslope, terrace, etc.):	Floodplain	Local relief (concave, convex, non	e): concave Slope: 1.0% / 0.6
Subregion (LRR or MLRA): MLRA	. 148 in LRR S Lat.:	40.276583 Long.:	- NAD 00
Soil Map Unit Name: Croton silt loa	am (CwA)		NWI classification: PEM
Are climatic/hydrologic conditions o		ear? Yes • No O (If no, ex	cplain in Remarks.)
Are Vegetation , Soil		• ,	rcumstances" present? Yes • No
			reamstances present.
Are Vegetation , Soil .			olain any answers in Remarks.)
		ampling point locations,	transects, important features, etc.
Hydrophytic Vegetation Present?	Yes No O		
Hydric Soil Present?	Yes No O	Is the Sampled Area Ye within a Wetland?	es No
Wetland Hydrology Present?	Yes ● No ○	Within a Wedana:	
	rident within the soil profile for this	sumple plot, therefore soils were t	soristacted naturally problematic.
Hydrology			
Wetland Hydrology Indicators:		Se	econdary Indicators (minimum of two required)
Primary Indicators (minimum of o	ne required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plant	· ·	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide (· ·	Drainage Patterns (B10)
Saturation (A3)		eres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduc		Dry Season Water Table (C2)
Sediment Deposits (B2) Drift deposits (B3)		tion in Tilled Soils (C6)	Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	☐ Thin Muck Surface		Stunted or Stressed Plants (D1)
Iron Deposits (B5)	U Other (Explain in R	remarks)	□
Inundation Visible on Aerial Image	ery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)		✓	FAC-neutral Test (D5)
Field Observations:			
Surface Water Present? Yes	•		
Water Table Present? Yes	No Depth (inches):		v. (a) v. (
Saturation Present? (includes capillary frings) Yes	No O Depth (inches):	Wetland Hydrolo	ogy Present? Yes No
(includes capillally intrige)	gauge, monitoring well, aerial photo	os, previous inspections), if availab	le:
Dosoribe Resorded Data (stream g	adge, memoring wen, dendi priete	so, providus inspections), il availub	
Remarks:			

		–Species? —		Sampling Point: ME1-SPW
	Absolute	Rel.Strat. In	dicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Cover	atus	Number of Dominant Species
1		0.0%		That are OBL, FACW, or FAC:4(A)
2		0.0%		Total Number of Dominant
3				Species Across All Strata:4(B)
4	0			
5	0	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC:100.0% (A/B)
6	0			That Are OBL, FACW, OF FAC.
7	0	0.0%		Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:	,0 =	= Total Cover		0BL speci es <u>10</u> x 1 = <u>10</u>
		0.000		FACW species <u>25</u> x 2 = <u>50</u>
1	0	0.0%		FAC species <u>35</u> x 3 = <u>105</u>
2		0.0%		FACU species x 4 =0
3	_	0.0%		UPL speci es $0 \times 5 = 0$
4		0.0%		' '
5		0.0%		Column Totals:
6		0.0%		Prevalence Index = B/A = 2.357
7		0.0%		Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
0	0	0.0%		✓ Prevalence Index is ≤3.0 1
Shrub Stratum (Plot size:)	=	= Total Cover		Morphological Adaptations ¹ (Provide supporting
1	0	0.0%		data in Remarks or on a separate sheet)
2		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
3.		0.0%		¹ Indicators of hydric soil and wetland hydrology must
4		0.0%		be present, unless disturbed or problematic.
5		0.0%		Definition of Vegetation Strata:
6		0.0%		Four Vegetation Strata:
		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7		= Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Herb Stratum (Plot size: _5')				Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum			AC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Impatiens pallida			ACW	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Typha latifolia		=	DBL	i i
4. Phalaris arundinacea		✓ 14.3% F	ACW	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Impatiens capensis	5		ACW	_
6. Persicaria perfoliata	5		AC	Five Vegetation Strata:
7		0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8	0	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in
9	0			diameter at breast height (DBH). Sapling stratum – Consists of woody plants, excluding woody
0		0.0%		vines, approximately 20 ft (6 m) or more in height and less
1	0			than 3 in. (7.6 cm) DBH.
2	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	=	= Total Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1	0	0.0%		including herbaceous vines, regardless of size, and woody
		0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
2		0.0%		Woody vines – Consists of all woody vines, regardless of
3		0.0%		height.
4				
5		0.0%		Hydrophytic
6				Vegetation
	0	= Total Cover		

Soil Sampling Point: ME1-SPW

Profile Descr	iption: (De	escribe to	the depth	needed to	document	the indic	cator or co	nfirm the	absence of indicators.)				
Depth		Matrix			Red	dox Featı							
(inches)		(moist)	%	Color	(moist)	%_	Tvpe 1	Loc²	Texture	Remarks			
0-6	5YR	3/2	_ 97	black		_ 3	C	M	Silty Clay				
6-12	7.5YR	4/1+	95	7.5YR	5/6	5	C	M	Silty Clay				
		-	-		-		-						
	-			-									
	-												
	-												
	-				-								
					-								
			on. RM=Red	uced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=Ma	atrix			
Hydric Soil I									Indicators for Proble	matic Hydric Soils ³ :			
Histosol (•				k Surface (•			2 cm Muck (A10)	(MLRA 147)			
	pedon (A2)						(S8) (MLRA		Coast Prairie Redo	x (A16)			
Black Hist							MLRA 147, 1	48)	(MLRA 147,148)	X (A10)			
	Sulfide (A4				my Gleyed)		Piedmont Floodpla	ain Soils (F19)			
	Layers (A5)				leted Matrix				(MLRA 136, 147)				
	k (A10) (LR			_	ox Dark Su	` '	7)		Very Shallow Dark	rk Surface (TF12)			
	Below Dark	,	A11)		leted Dark		7)		Other (Explain in Remarks)				
	k Surface (A	•			ox Depress		/E12) /LDD	N.I.					
☐ Sandy Mu MLRA 147	ck Mineral (7. 148)	(S1) (LRR I	N,		i-Marigaries RA 136)	e wasses	(F12) (LRR	IV,					
	eyed Matrix	(S4)		Um	bric Surface	e (F13) (MI	LRA 136, 12	22)					
Sandy Red		(- ')		Pied	Piedmont Floodplain Soils (F19) (MLRA 148) Piedmont Floodplain Soils (F19) (MLRA 148) 3 Indicators of hydrophytic vegetation wetland hydrology must be president for the pre					nydrophytic vegetation and			
	Matrix (S6)) (MLRA 12			rology must be present, sturbed or problematic.			
								•					
Restrictive La	ayer (if ob	served):											
Type:									Hydric Soil Present?	Yes No			
Depth (incl	hes):								Tryune Son Fresche	Tes C NO C			
Remarks:													
										ļ			
										ļ			

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Ber	rks Co. Samp	ling Date: 05-Oct-16
Applicant/Owner: Birdsboro Power,	LLC	State: PA	A Sampling Po	int: ME1-SPW2
Investigator(s): JY, PS		Section, Township, Range: S	т	R
Landform (hillslope, terrace, etc.):	Terrace	Local relief (concave, convex,	none): flat	Slope:1.0% /0.6 °
Subregion (LRR or MLRA): MLRA	148 in LRR S Lat.:	40.276754 Lo	ng.: -75.827173	Datum: NAD 83
Soil Map Unit Name: Croton silt loa		10.270701	NWI classification	
Are climatic/hydrologic conditions o		ear? Yes • No O (If no	o, explain in Remarks.)	
Are Vegetation, Soil		•	o, explain in Remarks.)	yes ● No ○
	· · · · · · · · · · · · · · · · · · ·		•	-
Are Vegetation			explain any answers in R	•
Hydrophytic Vegetation Present?	Yes O No		,	
	Yes O No O	To the Consuled Asses		
Hydric Soil Present?	Yes O No O	Is the Sampled Area within a Wetland?	Yes ● No ○	
Wetland Hydrology Present? Remarks:	Tes S NO S			
Hydrology				
Wetland Hydrology Indicators:			Secondary Indicators (min	imum of two required)
Primary Indicators (minimum of o	ne required; check all that apply)		Surface Soil Cracks (B	
Surface Water (A1)	True Aquatic Plants	s (B14)	Sparsely Vegetated Co	
☐ High Water Table (A2)	Hydrogen Sulfide (Odor (C1)	Drainage Patterns (B1	
Saturation (A3)	Oxidized Rhizospho	eres along Living Roots (C3)	Moss Trim Lines (B16)	
Water Marks (B1)	Presence of Reduc	ed Iron (C4)	☐ Dry Season Water Tab	le (C2)
Sediment Deposits (B2)	Recent Iron Reduc	tion in Tilled Soils (C6)	Crayfish Burrows (C8)	
Drift deposits (B3)	☐ Thin Muck Surface	(C7)	Saturation Visible on A	erial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in R	Remarks)	Stunted or Stressed PI	, ,
☐ Iron Deposits (B5)	(0.7)		✓ Geomorphic Position (D2)
Inundation Visible on Aerial Image	ry (B7)		Shallow Aquitard (D3)	C (D.)
Water-Stained Leaves (B9) Aquatic Fauna (B13)			Microtopographic Relie	ef (D4)
Field Observations:			FAC-neutral Test (D5)	
Surface Water Present? Yes	No Depth (inches):			
Water Table Present? Yes				
	4. ()		Irology Present? Yes	● No ○
(includes capillary fringe) Yes		0		
Describe Recorded Data (stream g	auge, monitoring well, aerial photo	os, previous inspections), if ava	illable:	
Domorko				
Remarks:	54	t		
Hydrology to this portion of the Mi	: I Wetland system originates from	watercourse NA2 (WWF, MF)		

President Plot size Plot			—Species? -		Sampling Point: ME1-SPW2
Test Stratum Plot size		Absolute		Indicator	Dominance Test worksheet:
1	Tree Stratum (Plot size:)	% Cover		Status	
2	1	0	0.0%		l ·
3.					That are obe, thow, of the.
4.					Total Number of Dominant
S	3	0			Species Across All Strata: 3 (B)
Section Stratum Plot size Stratum	4	0	0.0%		
6.	5	0	0.0%		
7			0.0%		That Are OBL, FACW, or FAC: 66.7% (A/B)
Sapling-Sapling/Shrub Stratum (Plot size:					Burnelin - Tudou and the st
Sapiling/Shrub Stratum		_			
	8	0			lotal % Cover of: Multiply by:
1.	Diot size:	,	= Total Cover	•	0BL speci es 0 x 1 = 0
2.	Sapling-Sapling/Shrub Stratum (Plot Size.				FACW species $30 \times 2 = 60$
2.	1	0_			
3.	2	0	0.0%		•
4.	3	0	0.0%		
Column Total s: 95			0.0%		UPL species $0 \times 5 = 0$
6.	***				Column Totals: 95 (A) 275 (B)
7.	<u> </u>				75 (7) =275
8	6	0			Prevalence Index = B/A = 2.895
8.	7	0	0.0%		Hydrophytic Vegetation Indicators:
9.	8.	0_	0.0%		
Dominance Test is > 50% Dominance Test is Soft on the Statum Prologory Plants, excluding woody vines, approximately > 20% Dominance Test is part at the Prologory Plants, excluding woody vines, approximately > 20% Dominance Test is part and Each Test is part and Each Tes			0.0%		
Shrub Stratum Plot size: 0	91				
Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)	10				✓ Prevalence Index is ≤3.0 ¹
1.	Shrub Stratum (Plot size:)	0	= Total Cover	•	Morphological Adaptations ¹ (Provide supporting
2.		0	0.0%		data in Remarks or on a separate sheet)
3.			0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
be present, unless disturbed or problematic. 5.					1- " - 4 1 1 1 1 1 1 1 1 1
5.					
6 .	4	0	0.0%		be present, unless disturbed of problematic.
6.	5	0	0.0%		Definition of Vegetation Strata:
7.			0.0%		Four Vegetation Strata:
Herb Stratum (Plot size: _s'			0.0%		
Septing/shrub stratum Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb stratum – Consists of all herbaceous (non-woody) plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall. Woody vines – Consists of all woody vines greater than 3.28 ft tall. Woody vines – Consists of all woody vines greater than 3.28 ft in height. Setarla parviflora					
1. Persicarla perfoliata 2. Persicarla pensylvanica 30	Herb Stratum (Plot size: 5')		= Total Cover		1 5
2. Persicaria pensylvanica 30	1. Persicaria perfoliata	40	✓ 42.1%	FAC	
3. Parthenocissus quinquefolia 4. Setaria parviflora 5	•••		31.6%	FACW	
4. Setarla parviflora 5					
5.					Woody vines - Consists of all woody vines greater than 3.28 ft
5.	4. Setaria parviflora		5.3%	FAC	
7.	5	0			
7.	6	0	0.0%		Five Vegetation Strata:
8.	7	0	0.0%		
9.	_	_	0.0%		
Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height. Sopring stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height. Woody vines – Consists of all woody vines, regardless of height. Hydrophytic Vegetation Present? Yes No					
10					_ ` <i>'</i>
Shrub stratum - Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Woody Vine Stratum (Plot size:) 95	10	_ 0_	0.0%		
12.	11	0	0.0%		than 3 in. (7.6 cm) DBH.
Woody Vine Stratum (Plot size:	12	0	0.0%		
Herb stratum Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height. O		95	= Total Cover		, , ,
1	Woody Vine Stratum (Plot size:)	,,,			
2	1	0	0.0%		
3	2.	0	0.0%		
4	3		0.0%		Woody vines – Consists of all woody vines, regardless of
5					, · · · · · · · · · · · · · · · · · · ·
6	4				
6	5	0	0.0%		Hydrophytic
<u> </u>	6	0	0.0%		Vegetation
Remarks: (Include photo numbers here or on a separate sheet.)		0	= Total Cove	r	Present? Yes ♥ No ∪
Remarks: (Include photo numbers here or on a separate sheet.)					l
	Remarks: (Include photo numbers here or on a separate she	et.)			

Soil Sampling Point: ME1-SPW2

Profile Descr	iption: (De	escribe to	the depth	needed to	documen	t the indi	cator or co	nfirm the	absence of indicators.)	IIILI OI WZ	
Depth Matrix Redox Features											
(inches)		(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	Texture	Remarks	
0-4	10YR	3/2	100						Silty Clay		
4-12	10YR	4/2	60	7.5YR	4/6	10	C	M	Sandy Clay Loam		
	7.5YR	4/4	30								
	-			-							
	-			-				-		· ·	
	-			-	-			-	-		
	-								-		
1 Type: C=Cop	centration I	D-Depletic	on PM-Pedi	icad Matrix	CS-Cover	ed or Coat	ed Sand Gra	ine 21 oca	ation: PL=Pore Lining. M=N	Matrix	
Hydric Soil I		•	JII. KIVI–KEUU	iceu iviati ix,	C3-C0Vei	eu or coat	eu Sanu Gra	IIIS -LUC			
Histosol (□ Darl	< Surface ((\$7)				ematic Hydric Soils ³ :	
	pedon (A2)						(S8) (MLRA	147.148)	2 cm Muck (A10)	(MLRA 147)	
Black Hist							ИLRA 147, 1		Coast Prairie Red	ox (A16)	
	Sulfide (A4)				Matrix (F2		,	(MLRA 147,148)		
Stratified	Layers (A5)				leted Matr				Piedmont Floodp (MLRA 136, 147)		
2 cm Mucl	k (A10) (LR	R N)		Red	ox Dark Su	urface (F6)			Very Shallow Dar	k Surface (TF12)	
Depleted	Below Dark	Surface (A	\11)	✓ Dep	leted Dark	Surface (F	7)		Other (Explain in Remarks)		
☐ Thick Darl	k Surface (A	112)			ox Depres				_ 、.	,	
Sandy Mu	ck Mineral ((S1) (LRR I	N,	☐ Iron	-Mangane A 136)	se Masses	(F12) (LRR I	٧,			
MLRA 147		(C.4)				e (F13) (M	LRA 136, 12	2)			
	eyed Matrix	(54)					s (F19) (MLF		³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
Sandy Red	Matrix (S6)) (MLRA 127				
Stripped in	watrix (50)			Keu	raieiii ivid	ateriai (i z i) (IVILIA 12)	, 147)	uniess ui	sturbed or problematic.	
Restrictive La	ayer (if ob	served):									
Type:									Hydric Soil Present?	Yes ● No ○	
Depth (incl	hes):								Tryulic Son Fresent:	res 🙂 No 🔾	
Remarks:											
										ļ	

Project/Site: Birdsboro Pow	ver LLC		City/County: Ex	eter Twp./Berks Co	Samp	oling Date: 10-Aug-16
Applicant/Owner: Birdsboro	Power, LLC			State: PA	Sampling P	oint: ME1-SPU
Investigator(s): KR, JY			Section, Townsh	ip, Range: S	т	R
Landform (hillslope, terrace,	, etc.): Hillside		Local relief (conca	ve, convex, none): convex	Slope: <u>9.0%</u> / <u>5.1</u> °
Subregion (LRR or MLRA):	MLRA 148 in LRR	S Lat.:	40.276425	Long.:	-75.826985	Datum: NAD 83
Soil Map Unit Name: _Croto	on silt loam (CwA)				NWI classification	n: UPL
Are climatic/hydrologic cond	ditions on the site ty	pical for this time of ye	ar? Yes • No	(If no, exp	olain in Remarks.)	
Are Vegetation 🗹 , So			ly disturbed?	•	cumstances" presen	_{t?} Yes O No 💿
Are Vegetation \Box , So	il 🗌 , or Hydrol	_	roblematic?		ain any answers in	
Summary of Finding	=		ampling poin	t locations,	transects, imp	oortant features, etc.
Hydrophytic Vegetation Pro		No 💿				
Hydric Soil Present?	Yes O	No 💿		mpled Area Yes	s ○ No ●	
Wetland Hydrology Presen	t? Yes	No 💿	within a \	Vetland?		
The upland sample plot is	· 			<u> </u>		
Hydrology						
Wetland Hydrology Indicat	tors:			Sec	condary Indicators (mi	nimum of two required)
Primary Indicators (minim	um of one required;				Surface Soil Cracks (E	·
Surface Water (A1)		True Aquatic Plants			Sparsely Vegetated C	
☐ High Water Table (A2) ☐ Saturation (A3)		Hydrogen Sulfide (Odor (C1) eres along Living Roo	to (C3)	Drainage Patterns (B	
Water Marks (B1)		Presence of Reduc	0 0	IS (C3)	Moss Trim Lines (B16 Dry Season Water Ta	•
Sediment Deposits (B2)			tion in Tilled Soils (C6)	Crayfish Burrows (C8)	
Drift deposits (B3)		☐ Thin Muck Surface	·	,	Saturation Visible on	
☐ Algal Mat or Crust (B4)		Other (Explain in R	•		Stunted or Stressed F	Plants (D1)
Iron Deposits (B5)					Geomorphic Position	(D2)
Inundation Visible on Aer	0 3 . ,				Shallow Aquitard (D3)	
Water-Stained Leaves (B9	?)				Microtopographic Rel	
Aquatic Fauna (B13)					FAC-neutral Test (D5)
Field Observations: Surface Water Present?	Yes ○ No ●	Depth (inches):				
Water Table Present?	Yes O No •	•				
Saturation Present?		Depth (inches):		Wetland Hydrolog	gy Present? Yes	s O No •
(includes capillary fringe)	Yes O No •	Depth (inches):				
Describe Recorded Data (s	tream gauge, monito	oring well, aerial photo	s, previous inspect	ions), if available) :	
Remarks:						
no hydrology indicators we	ere observed					

		Domina		Sampling Point: ME1-SPU
Tree Stratum (Plot size:)	Absolute % Cover			
1	0	0.09	%	Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
2	0	0.09	%	
3.		0.09	%	Total Number of Dominant Species Across All Strata: 2 (B)
4		0.09	 %	Species Across Air Strata.
5		0.09	 %	Percent of dominant Species
_		0.09		That Are OBL, FACW, or FAC: 0.0% (A/B)
6		0.09		Durandon de Trades sus dish deta
7				Prevalence Index worksheet:
8		0.09		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	= Total Co	over	0BL speci es
1	_	0.09	%	FACW species x 2 = 0
2		0.09	 %	FAC species x 3 =
3		0.09	 %	FACU species80 x 4 =320
··-		0.09		UPL species $0 \times 5 = 0$
4		0.09		Column Totals: 90 (A) 350 (B)
5				-
6	-	0.09		Prevalence Index = B/A = 3.889
7		0.09		Hydrophytic Vegetation Indicators:
8	0		<u> </u>	Rapid Test for Hydrophytic Vegetation
9	0		%	Dominance Test is > 50%
10	0	0.09	%	Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		= Total Co	ver	Morphological Adaptations ¹ (Provide supporting
1	0	0.09	%	data in Remarks or on a separate sheet)
		0.09		Problematic Hydrophytic Vegetation ¹ (Explain)
2		0.09		1 Indicators of hydric ceil and wetland hydrology must
3				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		0.09		•
5				Definition of Vegetation Strata:
6	0		<u> </u>	Four Vegetation Strata:
7	0	0.09	%	Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH),
Herb Stratum (Plot size: _5')	0	= Total Co	over	regardless of height.
1. Solidago canadensis	35	✓ 38.9	% FACU	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Lonicera japonica	30	33.3	% FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Ageratina altissima	10	11.1		regardless of size, and all other plants less than 3.28 ft tall.
4. Euthamia graminifolia	10	11.1		Woody vines – Consists of all woody vines greater than 3.28 ft
	5	5.69		in height.
5. Phytolacca americana		0.09		-
6	-			Five Vegetation Strata:
7	_	0.09		Tree - Woody plants, excluding woody vines, approximately 20
8			<u> </u>	ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9	0	0.09	%	Sapling stratum – Consists of woody plants, excluding woody
10	0	0.09	%	vines, approximately 20 ft (6 m) or more in height and less
11	0	0.09	%	than 3 in. (7.6 cm) DBH.
12	0	0.09	%	Shrub stratum – Consists of woody plants, excluding woody
	90	= Total Co	ver	vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb stratum – Consists of all herbaceous (non-woody) plants,
	0	0.09	%	including herbaceous vines, regardless of size, and woody
1		\equiv		species, except woody vines, less than approximately 3 ft (1
2		0.09		m) in height.
3		0.09		Woody vines – Consists of all woody vines, regardless of height.
4				-
5	0		%	Hydrophytic
6	0	0.09	%	Vegetation
	0	= Total Co	over	Present? Yes Vo
Remarks: (Include photo numbers here or on a separate shee	et.)			<u> </u>
no hydrophytic vegetation indicators observed	<i>)</i>			
Sprijao vogotationi indicatora obaci ved				

Soil Sampling Point: ME1-SPU

Profile Descr	iption: (Describe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators.)				
Depth	Matrix			dox Featu			,				
(inches)	Color (moist)	%	Color (moist)		Type 1	Loc2	Texture	Remarks			
0-6	7.5YR 4/6	100					Silt Loam				
				-							
			-	-							
				-			•				
							-				
								·			
1- 0.0											
		n. RM=Redu	iced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=N	Matrix			
Hydric Soil 1							Indicators for Probl	ematic Hydric Soils ³ :			
Histosol (•		Dark Surface (•			2 cm Muck (A10)) (MLRA 147)			
	pedon (A2)		Polyvalue Belov				Coast Prairie Rec	lox (A16)			
Black Hist			Thin Dark Surfa			48)	(MLRA 147,148)	(1.5)			
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2)							Piedmont Floodp				
Stratified Layers (A5) Depleted Matrix (F3)							(MLRA 136, 147))			
2 cm Muck (A10) (LRR N) Redox Dark Surface (F6)							Very Shallow Da	rk Surface (TF12)			
	Below Dark Surface (A	11)	Depleted Dark		7)		Other (Explain in Remarks)				
	k Surface (A12)		Redox Depress		(540) (155						
Sandy Mu MLRA 147	ıck Mineral (S1) (LRR N	l,	☐ Iron-Manganes MLRA 136)	se Masses ((F12) (LRR I	ν,					
			Umbric Surface	e (F13) (MI	RA 136, 12	2)					
Sandy Gie	eyed Matrix (S4)		☐ Piedmont Floor				³ Indicators of hydrophytic vegetation and				
	uox (33) Matrix (S6)						wetland hydrology must be present, unless disturbed or problematic.				
Suippeui	viatrix (30)		Red Parent Ma	teriai (FZT)	(IVILKA 12	7, 147)	uniess d	isturbed or problematic.			
Restrictive L	ayer (if observed):										
Type: <u>rr</u>	ncks										
Depth (inc	hes):_ <u>6''</u>						Hydric Soil Present?	Yes O No 💿			
Remarks:											
	indicators observed	ı									
Tio Tiyanic 30ii	malcators observed	•									

Project/Site: Birdsboro Powe	r LLC	City/County:	Exeter Twp./Berks Co	Sampling	Date: 25-Aug-16
Applicant/Owner: Birdsboro	Power, LLC		State: PA	Sampling Point:	PA1-SPU
Investigator(s): KR, JY		Section, Town	nship, Range: S	т	R
Landform (hillslope, terrace, e	etc.): Swale	Local relief (co	ncave, convex, none	concave s	lope:2.0%_ /1.1_ °
Subregion (LRR or MLRA):	MLRA 148 in LRR S		Long.:	-75.848670	Datum: NAD 83
Soil Map Unit Name: Raritar	n silt loam (RaB)			NWI classification:	 JPL
Are climatic/hydrologic condi		or this time of year? Yes	No O (If no, exp	lain in Remarks.)	
Are Vegetation \Box , Soil		significantly disturbed?	· · · · ·	umstances" present?	Yes O No •
Are Vegetation . , Soil		naturally problematic?		nin any answers in Rem	arks.)
Summary of Findings	s - Attach site map	showing sampling po	int locations, t	ransects, import	ant features, etc.
Hydrophytic Vegetation Pres	sent? Yes • No				
Hydric Soil Present?	Yes O No 🖲	Is the	Sampled Area	○ No ●	
Wetland Hydrology Present?	Yes O No 🖲	within	a Wetland?	○ NO ◎	
Remarks:					
construction activities and		of-way and adjacent to the rail		com to organicanity o	
Hydrology					
Wetland Hydrology Indicato	rs:		Sec	ondary Indicators (minimu	m of two required)
Primary Indicators (minimu	m of one required; check	all that apply)		Surface Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plants (B14)		Sparsely Vegetated Conca	ve Surface (B8)
High Water Table (A2)	_ H	Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)	
Saturation (A3)		Oxidized Rhizospheres along Living I		Moss Trim Lines (B16)	
Water Marks (B1)		Presence of Reduced Iron (C4)		Dry Season Water Table (C2)
Sediment Deposits (B2)		Recent Iron Reduction in Tilled Soils		Crayfish Burrows (C8)	
Drift deposits (B3)		Thin Muck Surface (C7)		Saturation Visible on Aeria	0 3 . ,
Algal Mat or Crust (B4)		Other (Explain in Remarks)		Stunted or Stressed Plants	; (D1)
☐ Iron Deposits (B5)	(07)			Geomorphic Position (D2)	
Inundation Visible on Aeria	Imagery (B7)			Shallow Aquitard (D3)	
Water-Stained Leaves (B9)				Microtopographic Relief (E)4)
Aquatic Fauna (B13)				FAC-neutral Test (D5)	
Field Observations: Surface Water Present?	Yes ○ No •	Depth (inches):			
	Yes ○ No ●	Depth (inches):			
			Wetland Hydrolog	y Present? Yes	No 💿
(includes capillary fringe)	Yes O No 🖲	Depth (inches):			
Describe Recorded Data (str	eam gauge, monitoring w	vell, aerial photos, previous insp	ections), if available	:	
Domorko					
Remarks:					
indicators were observed du		refore the geomorphic position	hydrology indicator i	s applicable. However,	no other hydrology
illuicators were observed ut	ing the new investigation	11.			

		-Species? -		Sampling Point: PA1-SPU		
	Absolute	Rel.Strat.	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: 30')	% Cover	Cover	Status	Number of Dominant Species		
1 Acer negundo	20	66.7%	FAC	That are OBL, FACW, or FAC: 3 (A)		
		33.3%	FACU			
		\neg	-17100	Total Number of Dominant		
3				Species Across All Strata:5(B)		
4	0	0.0%				
5	0	0.0%		Percent of dominant Species That Are OBL FACW or FAC: 60.0% (A/B)		
6		0.0%		That Are OBL, FACW, or FAC: 60.0% (A/B)		
7		0.0%		Prevalence Index worksheet:		
		0.0%		Total % Cover of: Multiply by:		
8						
Sapling-Sapling/Shrub Stratum (Plot size:) 30 :	= Total Cover		0BL speci es0 x 1 =0		
		0.004		FACW species <u>30</u> x 2 = <u>60</u>		
1	0	0.0%		FAC species50 x 3 =150		
2	0			<u> </u>		
3	0	0.0%		x :		
4	0	0.0%		UPL speci es $\frac{10}{}$ x 5 = $\frac{50}{}$		
5		0.0%		Column Totals: 120 (A) 380 (B)		
		0.0%				
6		\neg		Prevalence Index = B/A = 3.167		
7				Hydrophytic Vegetation Indicators:		
8	0	0.0%		Rapid Test for Hydrophytic Vegetation		
9	0	0.0%		✓ Dominance Test is > 50%		
10	0	0.0%		I =		
		= Total Cover		Prevalence Index is ≤3.0 ¹		
Shrub Stratum (Plot size:)				Morphological Adaptations 1 (Provide supporting		
1	0	0.0%		data in Remarks or on a separate sheet)		
2	0	0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)		
3		0.0%		¹ Indicators of hydric soil and wetland hydrology must		
4		0.0%		be present, unless disturbed or problematic.		
		\neg		Definition of Vegetation Strata:		
5		0.0%		_		
6	0	0.0%		Four Vegetation Strata:		
7	0	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH),		
Herb Stratum (Plot size: 5')		= Total Cover		regardless of height.		
				Sapling/shrub stratum – Consists of woody plants, excluding		
1. Impatiens capensis		33.3%	FACW	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
2. Setaria pumila		33.3%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants,		
3. Lonicera morrowli	20	✓ 22.2%	FACU	regardless of size, and all other plants less than 3.28 ft tall.		
4. Coronilla varia	10	11.1%	UPL	Woody vines – Consists of all woody vines greater than 3.28 ft		
5		0.0%		in height.		
		0.0%				
6				Five Vegetation Strata:		
7	0			Tree - Woody plants, excluding woody vines, approximately 20		
8	0	0.0%		ft (6 m) or more in height and 3 in. (7.6 cm) or larger in		
9	0	0.0%		diameter at breast height (DBH).		
10		0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less		
	0	0.0%		than 3 in. (7.6 cm) DBH.		
11				Shrub stratum – Consists of woody plants, excluding woody		
2	0	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.		
Woody Vine Stratum (Plot size:)	90 :	= Total Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,		
1	0	0.0%		including herbaceous vines, regardless of size, and woody		
		0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.		
2				, - -		
3				Woody vines – Consists of all woody vines, regardless of height.		
4	0	0.0%				
5	0	0.0%		Hydroubydia		
6.		0.0%		Hydrophytic Vegetation		
O		= Total Cover		Present? Yes No		
		– iotai cover				
Remarks: (Include photo numbers here or on a separate s	heet.)					
•						

Soil Sampling Point: PA1-SPU

Profile Descr	iption: (De	escribe to	the depth	needed to document	the indic	ator or co	nfirm the a	absence of indicators.)	TAIGIG			
Depth		Matrix			dox Featu							
<u>(inches)</u>		(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	Texture	Remarks			
0-6	7.5YR	3/2	100					Silty Clay Loam				
6-14	7.5YR	4/2	65					Silty Clay				
	2.5YR	4/4	25					Silty Clay				
	black		10						burnt ash			
	-											
¹ Type: C=Cond	¹ Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ² Location: PL=Pore Lining. M=Matrix											
Hydric Soil I	ndicators:							Indicators for Probl	ematic Hydric Soils ³ :			
Histosol (A	A1)			Dark Surface (S7)			2 cm Muck (A10)	•			
Histic Epip	pedon (A2)			Polyvalue Belo	w Surface ((S8) (MLRA	147,148)	Coast Prairie Red				
Black Hist				Thin Dark Surfa			48)	(MLRA 147,148)	OX (A16)			
	Sulfide (A4)			Loamy Gleyed)		Piedmont Floodp				
	Layers (A5)			Depleted Matri				(MLRA 136, 147)				
	k (A10) (LRI			Redox Dark Su	` ,	7)			k Surface (TF12)			
	Below Dark	,	11)	Depleted Dark Redox Depress		/)		Other (Explain in Remarks)				
	k Surface (A			☐ Iron-Manganes		(F12) (I RR	N					
☐ Sandy Mu MLRA 147	ck Mineral (', 148)	51) (LKK N	I,	MLRA 136)	ic masses ((1 12) (21111						
Sandy Gle	yed Matrix	(S4)		Umbric Surface	e (F13) (ML	_RA 136, 12	22)	3				
Sandy Red	dox (S5)			☐ Piedmont Floo	dplain Soils	(F19) (MLI	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
Stripped N	Natrix (S6)			Red Parent Ma	terial (F21)) (MLRA 12	7, 147)	unless disturbed or problematic.				
Restrictive La	aver (if oh	served):										
Type:	., (05.											
Depth (incl	nes):							Hydric Soil Present?	Yes O No 💿			
Remarks:												
soil mixing wa	as likely a	result of i	orevious di	sturbance								
Jon mixing we	as intoly u	rosum or p	or ovious u	Star Barros								

Project/Site: Birdsboro Power LLC		City/County: Exeter Twp./Be	rks Co. Sampling Date: 05-Oct-16
Applicant/Owner: Birdsboro Power,	LLC	State: P.	A Sampling Point: WN1-SPW
Investigator(s): JY, PS		Section, Township, Range: 9	S T R
Landform (hillslope, terrace, etc.):	Floodplain	Local relief (concave, convex,	none): <u>flat</u> Slope: <u>0.0%</u> / <u>0.0</u> °
Subregion (LRR or MLRA): MLRA	A 148 in LRR S Lat.:	40.275573 Lo	ong.: -75.821035
Soil Map Unit Name: Raritan silt lo	oam (RaB)		NWI classification: PEM
Are climatic/hydrologic conditions o	on the site typical for this time of ye	ear? Yes • No O (If no	o, explain in Remarks.)
Are Vegetation, Soil	, or Hydrology significant		al Circumstances" present? Yes No
Are Vegetation 🗸 , Soil 🗌	, or Hydrology 🔲 naturally p	problematic? (If needed,	, explain any answers in Remarks.)
Summary of Findings - At		sampling point locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes No		
Hydric Soil Present?	Yes No	Is the Sampled Area	Yes ● No ○
Wetland Hydrology Present?	Yes ● No ○	within a Wetland?	
seasonal drought conditions possi		ies within the wetland system.	etation was considered naturally problematic due to Based on this reasoning, the location of the dered to be a wetland.
Hydrology			
Wetland Hydrology Indicators: Primary Indicators (minimum of o Surface Water (A1) High Water Table (A2) ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Image Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? (includes capillary fringe) Describe Recorded Data (stream g	True Aquatic Plant Hydrogen Sulfide (Oxidized Rhizosph Presence of Reduct Recent Iron Reduct Thin Muck Surface Other (Explain in Ferry (B7) No Depth (inches): Depth (inches):	Odor (C1) eres along Living Roots (C3) ced Iron (C4) ction in Tilled Soils (C6) e (C7) Remarks) Wetland Hyd	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Moss Trim Lines (B16) Dry Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-neutral Test (D5)
Dosonibo Nosoraca Data (stream g	jaage, meritering wen, aeriai priete	os, providus inspositoris), ii ave	
Remarks:			
Rain events (within 7 days of field	investigation) exceeded 2" of pred	cipitation and likely resulted in	the observed saturation during the field investgation.

				ominant		Sampling Point: WN1-SPW			
		Absolute	Re		Indicator	Dominance Test worksheet:			
Tree S	Stratum (Plot size:)	% Cover			Status	Number of Dominant Species			
				0.0%		That are OBL, FACW, or FAC:1(A)			
		-	Н	0.0%		Total Number of Dominant			
3			\square	0.0%		Species Across All Strata:4(B)			
			\square	0.0%		Damant of daminant Cresics			
			\square	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC:25.0% (A/B)			
6			\square	0.0%					
7			\sqcup	0.0%		Prevalence Index worksheet:			
8			Ш	0.0%		Total % Cover of: Multiply by:			
Saplin	ng-Sapling/Shrub Stratum (Plot size:)	:	= To	tal Cover		0BL speci es 0 x 1 = 0			
			П	0.0%		FACW species			
			\Box	0.0%		FAC speci es x 3 =0			
			\Box	0.0%		FACU species $\underline{50}$ x 4 = $\underline{200}$			
			\Box	0.0%		UPL speci es $0 \times 5 = 0$			
			\Box	0.0%		Col umn Total s: 80 (A) 260 (B)			
			\Box	0.0%		Dravelance Index D/A 2.050			
			\Box	0.0%		Prevalence Index = B/A = 3.250			
				0.0%		Hydrophytic Vegetation Indicators:			
			П	0.0%		Rapid Test for Hydrophytic Vegetation			
			Н			☐ Dominance Test is > 50%			
			<u> </u>	0.0%		Prevalence Index is ≤3.0 ¹			
	Stratum (Plot size: 15')	:		tal Cover		Morphological Adaptations ¹ (Provide supporting			
	ibus allegheniensis			100.0%	FACU	data in Remarks or on a separate sheet)			
			Ц	0.0%		☐ Problematic Hydrophytic Vegetation ¹ (Explain)			
3		0	\square	0.0%		Indicators of hydric soil and wetland hydrology must			
4		0	Щ	0.0%		be present, unless disturbed or problematic.			
5		0		0.0%		Definition of Vegetation Strata:			
				0.0%		Four Vegetation Strata:			
7		0		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH),			
Herb 9	Stratum (Plot size: <u>5'</u>)	20=	= To	tal Cover		regardless of height.			
	ildago gigantea	25	V	33.3%	FACW	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.			
	echoma hederacea	20	V	26.7%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,			
	rex spp.	15	<u>_</u>	20.0%	NI	regardless of size, and all other plants less than 3.28 ft tall.			
	peratina altissima	10		13.3%	FACU	Woody vines – Consists of all woody vines greater than 3.28 ft			
	alaris arundinacea	5		6.7%	FACW	in height.			
•		0		0.0%		Five Manatation Chuston			
		0		0.0%		Five Vegetation Strata:			
		_		0.0%		Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in			
			\Box	0.0%		diameter at breast height (DBH).			
			\Box	0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less			
		0	\Box	0.0%		than 3 in. (7.6 cm) DBH.			
12		0	\Box	0.0%		Shrub stratum – Consists of woody plants, excluding woody			
			 = To	tal Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.			
	y Vine Stratum (Plot size:)					Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody			
				0.0%		species, except woody vines, less than approximately 3 ft (1			
				0.0%		m) in height.			
				0.0%		Woody vines – Consists of all woody vines, regardless of height.			
4				0.0%					
5		0		0.0%		Hydrophytic			
6		0	Ш	0.0%		Vegetation			
		0	= T	otal Cover		Present? Yes No			

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation was considered naturally problematic due to seasonal drought conditions that may have reduced hydrology to the wetland system and contributed to the proliferation of non-wetland plant species. The proliferation of hydrophytic plant species earlier in the growing season was evident based on the observed remains of a unidentifiable carex species.

Soil Sampling Point: WN1-SPW

Profile Descr	iption: (De	escribe to	the depth	needed to d	locumen	t the indic	cator or co	nfirm the a	absence of indicators.)	Will Ol W	
Depth		Matrix									
(inches)	Color	(moist)	%	Color (moist)	%_	Tvpe 1	Loc2	Texture	Remarks	
0-8	5YR	3/2	98	7.5YR	4/6	_ 2	C	M	Sandy Clay Loam		
8-14	5YR	3/2	80	2.5YR	4/4	20	C	M			
	-								-		
	-				-				-		
• • •		•	on. RM=Redu	iced Matrix,	CS=Cover	ed or Coat	ed Sand Gra	ins ² Loca	ition: PL=Pore Lining. M=Ma	atrix	
Hydric Soil I		:							Indicators for Proble	ematic Hydric Soils ³ :	
Histosol (•			_	Surface (. ,			2 cm Muck (A10)	(MLRA 147)	
	pedon (A2)						(S8) (MLRA		Coast Prairie Redo	ox (A16)	
Black Hist							MLRA 147, 1	48)	(MLRA 147,148)	()	
	Sulfide (A4					Matrix (F2)		Piedmont Floodpla	ain Soils (F19)	
	Layers (A5)				eted Matri				(MLRA 136, 147)		
	k (A10) (LR					ırface (F6) Surface (F	7)				
	Below Dark		(11)		ox Depress		7)		Other (Explain in I	Remarks)	
	k Surface (A	•					(F12) (LRR	NI.			
☐ Sandy Mu MLRA 147	ick Mineral (7, 148)	(S1) (LRR I	ν,	MLR	A 136)	oc masses	(1 12) (LIKIK)	Ψ,			
	eyed Matrix	(S4)		Umb	oric Surfac	e (F13) (M	LRA 136, 12	2)			
Sandy Re				Pied	mont Floo	dplain Soils	s (F19) (MLF	RA 148)	³ Indicators of h	nydrophytic vegetation and	
Stripped N	Matrix (S6)			Red	Parent Ma	iterial (F21) (MLRA 12	7, 147)	wetland hydrology must be present, unless disturbed or problematic.		
	<i></i>										
Restrictive La	ayer (if ob	served):									
Type:	h \								Hydric Soil Present?	Yes No	
Depth (incl	nes):								,	100 1 110 1	
Remarks:											

Stream Name: Schuylkill River	Project/Task Number: 216040.01
Date:	Investigators: JY, KR, LD
PADEP Stream Name/Code: Schuylkill River	Existing Use Chapter 93 Designation: WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny

Current Weat	her: Sun	ny 80-90s					Antecedent V	Veather:		Sunny				
Stream Hydrology: Hydrology Source(s) (check apply):			(check all	that	Channel Condition	Common Substrate Type(s) (check all >20%):								
Watershed Area	1,000,000+	icres	Spring		Wetland		USGS Solid Blue Line	X	Depositional Bars & Benches	X	Bedrock		Silt	X
Stream Order	7		Seep	X	Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	X	Clay	X
Estimated Flow	>500 gal	/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	L
Water Depth	24+ in	ches	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	240+ in	ches	Pond				Riffle-Pool Sequences	X			Sand	X		
•							Riffle-Pool	v				v	Artificial	

Aquatic Life:

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clan	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				A macroinverteb	rate study w	vas not conducted.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; Ab	oundant = 25-99; V	ery Abunda	int = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	X
Riffle-pool sequences common	X
≥ Second order stream	X

Intermittent	
Very low flow or dry channel during summer/fall	
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	
Erosional channel/lacks alluvuial deposits	
Terrestrial vegetation in channel	
Channel filled with leaves/debris	
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	
First order, headwater stream	
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	X	Perennial	Intermittent	Ephemera
				_

Stream Name: Hay Creek	Project/Task Number: 216040.0	1
Date: 7/12/2016	Investigators: JY, KR, LD	
PADEP Stream Name/Code: Hay Creek	Existing Use Chapter 93 Designation:	CWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny	

Current Weath	ner: Sum	ny 80-90s					Antecedent W	Veather:		Sunny				
Stream Hydrology: Hydrology Source(s) (check apply):) (check all	that	Channel Conditions (check all that apply):					Common Substrate Type(s) (check all >20%):				
Watershed Area	a	acres	Spring		Wetland		USGS Solid Blue Line	X	Depositional Bars & Benches	X	Bedrock		Silt	X
Stream Order	4+		Seep	X	Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	X	Clay	X
Estimated Flow	>100 gal	/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	2 to 4	feet	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	>15	feet	Pond				Riffle-Pool Sequences	X			Sand	X		

Aquatic Life:

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clan	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				A macroinverteb	rate study w	vas not conducted.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; Ab	oundant = 25-99; V	ery Abunda	int = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	X
Riffle-pool sequences common	X
≥ Second order stream	X

Intermittent	
Very low flow or dry channel during summer/fall	
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	
Watershed >10acres but <40 acres	

Ephemeral
Dry channel during winter/spring
Flow only in response to rainfall
Little or no aquatic life
Erosional channel/lacks alluvuial deposits
Terrestrial vegetation in channel
Channel filled with leaves/debris
Bank soils at OLW: matrix chroma ≥ 3
Channel grain size = floodplain
First order, headwater stream
Dendritic pattern on USGS
Watershed <10 acres

Determination:	X	Perennial	Intermittent	Ephemeral
			 	 1 -

				STRE	AM DE	TERMI	NATION FIE	LD DA	ГА FORM					
Stream Name	e: AR5						Project/Task	. Number	r:	216040.	.01			
Date:	11/9/2016						Investigators	s:	JY					
PADEP Strea	nm Name/Code:			N/A		-	Existing Use	Chapter	r 93 Designatio	on:	W	WF, M	ЛF	
Current Weatl	her: Rainy,	60s-70s					Antecedent V	Weather:	:	Sunny				
Stream Hydrology	<u>y:</u>		Hydrology apply):	y Source(s	s) (check all	that	Channel Condition	ons (check	all that apply):		<u>Common Su</u> ≥20%):	abstrate '	Type(s) (check	k all
Watershed Area	acre	s	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1		Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder	 	Clay	X
Estimated Flow	gal/mir	n	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble		Detritus	X
Water Depth	inche	:s	Lake		1		OHW Mark		Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	2 to 5 fee	et	Pond		1		Riffle-Pool Sequences		Vegetation		Sand	X	-	
		J			_		Sequences]		L			
Aquatic Life:	Organism	Indicator	Abundance		esent, Common	n, Abundant,	, , ,	Organism	1	Indicator	Abundance (Rare, Present,	Common	Abundant, Ve	rv Abundant
Fish	- Iganisii	P	+	Very A	Abundant)		Scuds (Amphipo			I	Tibulitanies (xais, x		710011011111,	y rioundi
Spring salamander	er	P	+				Aquatic sowbugs)	I	+			
Northern two-line		P					Crayfish (Decape	oda)		P				
Seal salamander		P					Leeches (Hirudir	nea)	-	I				
Northern dusky sa	alamander	I					Aquatic segment	ted worms	(Oligochaeta)	I				
Mountain dusky s	alamander	I					Flatowrms (Platy	yhelminthe	s)	I				
Mayfly nymphs (I	Ephemeroptera)	P					Aquatic snails (C	Gastropoda	.)	P/I				
Stonefly nymphs ((Plecoptera)	P					Fingernail clams	(Sphaeriid	iae)	P/I				
Caddisfly larvae ((Tricoptera)	P					Freshwater muss	sels (Union	idae)	I				
Midge larvae (Chi	.ironomidae)	P/I												
Black fly larvae (S	Simulidae)	I					Photograph	View			Notes			
Cranefly larvae (T	Γipulidae)	P					il				observed. Watercourse of			r
Riffle beetles (Elm	midae)	P					il		- ummamamea aai	I VIa cuivei	ts then disperses into ope	ell, mat an	ea.	
Water pennies (Ps	sephenidae)	P					il		1					ļ
Aquatic beetles (C	Zoleoptera)	P					i		1					
Water bugs (Hemi	iptera)	P					i		1					
Dobsonfly larvae	(Corydalidae)	P					i		1					
Alderfly larvae (S	Zialidaa)	р					ĺ		1					

Damselfly nymphs (Zygoptera)

Dragonfly nymphs (Anisoptera)

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

P

P

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Very low flow or dry channel during summer/fall I > P Indicators I > P (No. Organisms) Only "I" salamanders present Broken blue line on USGS map Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3
I > P (No. Organisms) Only "I" salamanders present Broken blue line on USGS map Bank soils at OLW: matrix chroma 1-2 and mottle chroma
Only "I" salamanders present Broken blue line on USGS map Bank soils at OLW: matrix chroma 1-2 and mottle chroma
Broken blue line on USGS map Bank soils at OLW: matrix chroma 1-2 and mottle chroma
Bank soils at OLW: matrix chroma 1-2 and mottle chroma
chroma 1-2 and mottle chroma
Channel grain size > floodplain
Alluvial bars & benches present
Riffle-run habitat common, well- developed pools uncommon
First or second order stream X
Watershed >10acres but <40 acres

 $Rare = 1\text{-}3; Present = 4\text{-}10; Common = 11\text{-}24; Abundant = 25\text{-}99; Very \ Abundant = 100\text{+}10\text{-}1$

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	X

Determination: Pere	ennial Interm	ittent X	Ephemeral
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Stream Name: ARK2	Project/Task Number: 216040.01	
Date: 8/10/2016	Investigators: JY, KR	
PADEP Stream Name/Code: N/A	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny	
Hydrology Source(s) (cheek	all that	Common Substrate Type(a) (abook all

Current Weath	ner: Sunny 80)-90s				Antecedent W	/eather:		Sunny				
Stream Hydrology	<u>:</u>	<u>Hydrology</u> apply):	Source(s)	(check all	that	Channel Condition	ns (check	all that apply):		Common S >20%):	ubstrate T	ype(s) (checl	k all
Watershed Area	acres	Spring		Wetland	X	USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder	X	Clay	Х
Estimated Flow	gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	X	Debris-filled	X	Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	3 to 20 feet	Pond				Riffle-Pool Sequences				Sand	X		

Aquatic Life:

Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	1	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P						observed. Braided channel areas were observed during area originated at outfall culvert from Arkema property.
Riffle beetles (Elmidae)	P				neia mresugano	watereou	noe ongamica at outtain curvett nom microsam property.
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	X Intermittent	Ephemeral
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Stream Name: ARK3	Project/Task Number: 216040.01
Date: 8/10/2016	Investigators: JY, KR
PADEP Stream Name/Code: N/A	Existing Use Chapter 93 Designation: WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny

							,						
Current Weathe	er: Sunny 80)-90s				Antecedent V	Veather:		Sunny				
Stream Hydrology:		<u>Hydrology</u> <u>apply):</u>	Source(s	(check all	that	Channel Condition	ons (check	all that apply):		<u>Common Su</u> >20%):	ubstrate T	ype(s) (chec	k all_
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	X	Debris-filled	X	Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	8 to 12 feet	Pond				Riffle-Pool Sequences				Sand	X		
	•			_						ı		1	

Aquatic Life:

Aquatic Life:						,	
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	1	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P						observed. Watercourse originated at outfall culvert ains hydrology from the watercourse tributary ARK5.
Riffle beetles (Elmidae)	P				- from 7 trkema pre	perty and g	and hydrology from the watercourse aroundly fixed.
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	c Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well-developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Dry channel during winter/spring Flow only in response to rainfall	

Little or no aquatic life X	
Erosional channel/lacks alluvuial deposits X	
Terrestrial vegetation in channel	
Channel filled with leaves/debris X	
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	
First order, headwater stream X	
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	X Intermittent	Ephemera

			01112				32 2:1:						
Stream Name	: ARK5					Project/Task	Number		216040.0	1			
Date:	8/10/2016					Investigators:	:	JY, KR					
PADEP Stream Name/Code: N/A					Existing Use	Existing Use Chapter 93 Designation: WWF, MF					F		
Current Weat	her: Sunny 8	0-90s				Antecedent V	Veather:		Sunny				
Stream Hydrolog	<u>y:</u>	Hydrology apply):	y Source(s)	(check all	that	Channel Condition	ons (check	all that apply):		Common S >20%):	ubstrate T	ype(s) (chec	k all
Watershed Area	acres	Spring		Wetland	X	USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	3 to 20 feet	Pond				Riffle-Pool				Sand	X	1	

Aquatic Life:

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clan	ns (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P						observed. Braided channel areas were observed during area originated at outfall culvert from Arkema property.
Riffle beetles (Elmidae)	P				icia investigatio	ii. watereot	inse originated at outrain curvert from Arkema property.
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	c Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	
Solid blue line on USGS map	
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	
Alluvial bars & benches common	
Riffle-pool sequences common	
≥ Second order stream	

Intermittent					
Very low flow or dry channel during summer/fall	X				
I > P Indicators					
I > P (No. Organisms)					
Only "I" salamanders present					
Broken blue line on USGS map					
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3					
Channel grain size > floodplain	X				
Alluvial bars & benches present					
Riffle-run habitat common, well- developed pools uncommon					
First or second order stream	X				
Watershed >10acres but <40 acres					

Ephemeral					
Dry channel during winter/spring					
Flow only in response to rainfall					
Little or no aquatic life	X				
Erosional channel/lacks alluvuial deposits	X				
Terrestrial vegetation in channel					
Channel filled with leaves/debris	X				
Bank soils at OLW: matrix chroma ≥ 3					
Channel grain size = floodplain					
First order, headwater stream	X				
Dendritic pattern on USGS					
Watershed <10 acres					

Determination:	Perennial	X I	ntermittent	Ephemeral

			BIKE	ANI DE	1 121(1411)	MITONTIL	עם עם	IATOM					
Stream Name	: ARK6					Project/Task	Numbe	r:	216040.01				
Date:	8/10/2016					Investigators:	:	JY, KR					
PADEP Strea	m Name/Code:	UNT to	Schuyl	kill Rive	r	Existing Use	Chapte	r 93 Designatio	on:	W	/WF, M	F	
Current Weat	her: Sunny 8	60-90s				Antecedent V	Veather	:	Sunny				
Stream Hydrology: Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):			Common St >20%):	Common Substrate Type(s) (check all >20%):						
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder		Clay	X
Estimated Flow	gal/min	Run-off	Х	Outfall	X	Continuous Bed	X	Debris-filled		Cobble		Detritus	

OHW Mark

Riffle-Pool Sequences Terrestrial Vegetation

X

Gravel

Sand

Artificial

X

Aquatic Life:

Water Depth

TOB Width

inches

feet

4 to 12

Lake

Pond

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Platyhelminthes)			I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)			P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clams (Sphaeriidae)			P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mussels (Unionidae)		I		
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	
Channel filled with leaves/debris	
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$	
Channel grain size = floodplain	
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	X I	ntermittent	Ephemeral

Date: 8/4/2016 Inve	vestigators: JY, KR
PADEP Stream Name/Code: UNT to Schuylkill River Exist	xisting Use Chapter 93 Designation: WWF, MF
Current Weather: Sunny 80-90s Ant	ntecedent Weather: Sunny

Current Weath	ner: Sunny 80-	-90s				Antecedent Weat	ther:	Sunny				
Stream Hydrology: Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):			<u>Common S</u> >20%):	Common Substrate Type(s) (check all >20%):					
Watershed Area	acres	Spring		Wetland	X	USGS Solid Blue Line	Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line	Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall		Continuous Bed & Banks	Debris-filled	х	Cobble	X	Detritus	X
Water Depth	inches	Lake				OHW Mark	Terrestrial Vegetation	х	Gravel	X	Artificial	
TOB Width	3 to 8 feet	Pond				Riffle-Pool Sequences			Sand	X		

Aquatic Life:

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Platyhelminthes)			I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)			P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clams (Sphaeriidae)			P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mussels (Unionidae)		I		
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well-developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	X

Determination:	Perennial	Intermittent	X	Ephemeral
				_

Stream Name: BR3	Project/Task Number: 216040.01	
Date: 11/8/2016	Investigators: JY, PS	
PADEP Stream Name/Code: UNT to Schuylkill River	Existing Use Chapter 93 Designation: WWF, MF	
Current Weather: Sunny, 50s-60s	Antecedent Weather: Sunny	

Current Weatl	Antecedent Weather: Sunny												
Stream Hydrology: Hydrology Source(s) (check all that apply);						Channel Conditions (check all that apply): Channel Conditions (check all that apply): ≥20%):						c all_	
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble	X	Detritus	X
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	1 to 2 feet	Pond				Riffle-Pool Sequences				Sand	X		

Aquatic Life:

Aquatic Life:		Abundance (Rare, Present, Common, Abundant,	-				
Organism	Indicator	Very Abundant)		Organism	l .	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriio	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

X
X
X
X
X
X

Determination:	Perennial	Intermittent	X	Ephemeral
				_

			STRE	AM DE	FERMI	NATION FIEI	LD DAT	TA FORM					
Stream Name	EX1					Project/Task	Number	:	216040.0	01			
Date:	Investigators:	Investigators: JY, KR											
PADEP Stream Name/Code: Heisters Creek					Existing Use Chapter 93 Designation:			V	WWF, MF				
Current Weather: Sunny 80-90s						Antecedent V	Antecedent Weather: Sunny						
Stream Hydrology: Hyd appl			y Source(s) (check all	that_	Channel Condition	ons (check	all that apply):		<u>Common S</u> >20%):	ubstrate T	ype(s) (chec	k all
Watershed Area	acre	Spring	X	Wetland	X	USGS Solid Blue Line	X	Depositional Bars & Benches	X	Bedrock		Silt	X
Stream Order	>3	Seep	X	Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	X	Clay	X
Estimated Flow	50-100 gal/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	

OHW Mark

Riffle-Pool Sequences

Terrestrial Vegetation

X

Aquatic Life:

Water Depth

TOB Width

1 to 4+

40 to 60

feet

feet

Lake

Pond

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	1	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Decap	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mussels (Unionidae)		I		
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				A macroinverteb	rate study w	as not conducted.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Stream Indicators:

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	X
Riffle-pool sequences common	X
≥ Second order stream	X

Very low flow or dry channel during summer/fall I > P Indicators I > P (No. Organisms)
I > P (No. Organisms)
Only "I" salamanders present
Broken blue line on USGS map
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3
Channel grain size > floodplain
Alluvial bars & benches present
Riffle-run habitat common, well-developed pools uncommon
First or second order stream
Watershed >10acres but <40 acres

Ephemeral
Dry channel during winter/spring
Flow only in response to rainfall
Little or no aquatic life
Erosional channel/lacks alluvuial deposits
Terrestrial vegetation in channel
Channel filled with leaves/debris
Bank soils at OLW: matrix chroma≥ 3
Channel grain size = floodplain
First order, headwater stream
Dendritic pattern on USGS
Watershed <10 acres

Gravel

Sand

Artificial

X

Determination:	X Perennial	Intermittent	Ephemeral
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					STRE	AM DE	ГЕRМІ	NATION FIE	LD DA	ГА FORM					
Stream Name:	: EX	(2						Project/Task Number: 21604			216040.	.01			
Date:	8/18/2016			-	-		-	Investigators	.:	JY, KR		-	-		
PADEP Stream	m Name/Cod	le:		UNT	to Schu	ıylkill		Existing Use	Chapter	r 93 Designatio	on:	W	VWF, M	1F	
Current Weath	her: Su	nny 8	80-90s			<u> </u>		Antecedent V	Weather:	:	Sunny				
Stream Hydrology:				Hydrology Source(s) (check all that apply):			Channel Conditi	Channel Conditions (check all that apply):			Common Substrate Type(s) (check all >20%):			k all	
Watershed Area		acres	l	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	\neg	l	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	 	Clay	X
Estimated Flow	g	gal/min	I	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble		Detritus	X
Water Depth		inches	l	Lake		'		OHW Mark		Terrestrial Vegetation	х	Gravel	х	Artificial	
TOB Width	6 to 10	feet	l	Pond				Riffle-Pool Sequences		- Vegennon		Sand	х	1	
Aquatic Life:	-			ι		ı				_		L		1	
	Organism	$\overline{}$	Indicator	Abundance (Rare, Present, Common, Abundant,			Organism			Indicator	Abundance (Rare, Present,	, Common	, Abundant, Ve	ry Abundant	
Fish	<u> </u>	\dashv	P	-	Very Abundant)			Scuds (Amphipo			I				
Spring salamander	r	\dashv	P					Aquatic sowbugs)	I				
Northern two-lined	d salamander	\neg	P				Crayfish (Decap	Crayfish (Decapoda) P							
Seal salamander			P					Leeches (Hirudin	nea)	-	I			-	
Northern dusky sal	alamander	\neg	I				Aquatic segmente	ed worms	(Oligochaeta)	I					
Mountain dusky sa	alamander	\neg	I					Flatowrms (Platyhelminthes)			I				
Mayfly nymphs (E	Ephemeroptera)		P					Aquatic snails (G	Jastropoda`	.)	P/I				
Stonefly nymphs ((Plecoptera)		P					Fingernail clams	(Sphaeriid	dae)	P/I				
Caddisfly larvae (Tricoptera)	\neg	P					Freshwater muss	Freshwater mussels (Unionidae)		I				
Midge larvae (Chi	ironomidae)		P/I					i							-
Black fly larvae (S	Simulidae)		I					Photograph	View		ı	Notes			
Cranefly larvae (T	l'ipulidae)		P					i		A macroinvertebrate study was not conducted.					
Riffle beetles (Elm	nidae)		P					i							
Water pennies (Pse	sephenidae)		P					i							
Aquatic beetles (C	Coleoptera)		P					i		1					
Water bugs (Hemi	iptera)	\neg	P					i		=					
Dobsonfly larvae (Corydalidae) P		P							1						

Alderfly larvae (Sialidae)

Damselfly nymphs (Zygoptera)

Dragonfly nymphs (Anisoptera)

P

P

P

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix $chroma \ge 3$	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination: Pere	ennial Interm	ittent X	Ephemeral
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Stream Name: EX4	Project/Task Number: 216040.01	
Date: 8/18/2016	Investigators: JY, KR	
PADEP Stream Name/Code: UNT to Schuylkill	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny	

Current Weatl	her: Sunny 8	60-90s				Antecedent Wear	ther:	Sunny				
Stream Hydrology	<u>Hydrology</u> apply):	Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):			<u>Common Si >20%):</u>	Common Substrate Type(s) (check all >20%):			
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line	Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line	Eroded Channel		Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	Debris-filled	X	Cobble		Detritus	X
Water Depth	inches	Lake				OHW Mark	Terrestrial Vegetation	X	Gravel	X	Artificial	X
TOB Width	4 to 10 feet	Pond				Riffle-Pool Sequences			Sand	X		

Aquatic Life:

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriic	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well-developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	Intermittent	X	Ephemeral
				_

				STRE	AM DE	ΓERMI	NATION FIEI	LD DA'	ΓA FORM					
Stream Name	»:	FR1					Project/Task	Numbe	r:	216040.01				
Date:	7/13/2016	5					Investigators:		JY, KR					
PADEP Strea	m Name/C	Code:	UNT to	Schuyl	kill Rive	•	Existing Use	Chapte	r 93 Designation	on:	V	VWF, M	I F	
Current Weat	her:	Sunny 80	-90s				Antecedent W	Veather	:	Sunny				
Stream Hydrolog	<u>y:</u>		Hydrology apply):	Source(s) (check all	that	Channel Condition	ns (check	all that apply):		Common S >20%):	ubstrate I	Type(s) (chec	k all
Watershed Area		acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches	X	Bedrock		Silt	X
Stream Order			Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder		Clay	X
Estimated Flow	<1	gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	0-3	inches	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	10-Jun	feet	Pond				Riffle-Pool Sequences				Sand	X		

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	1	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Decap	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				A macroinverteb	rate study w	as not conducted.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	X
Riffle-pool sequences common	
≥ Second order stream	

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	X
First or second order stream	X
Watershed >10acres but <40 acres	

Dry channel during winter/spring Flow only in response to rainfall Little or no aquatic life X Erosional channel/lacks alluvuial deposits X Terrestrial vegetation in channel X	
Little or no aquatic life X Erosional channel/lacks alluvuial deposits X	
Erosional channel/lacks alluvuial deposits X	
Terrestrial vegetation in channel X	
Channel filled with leaves/debris X	
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain X	
First order, headwater stream X	
Dendritic pattern on USGS	
Watershed <10 acres	

	Determination:	X Perennial	Intermittent	Ephemeral
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Stream Name: MB1	Project/Task Number: 216040.01	
Date: 7/13/2016 & 8/10/2016	Investigators: JY, KR	
PADEP Stream Name/Code: UNT to Schuylkill	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny	

Current Weat	her: Sunny 80-	-90s				Antecedent W	Veather:		Sunny				
Stream Hydrology	Hydrology apply):	Source(s)) (check all	that	Channel Conditio	ons (check	all that apply):		Common S >20%):	ubstrate T	ype(s) (checl	k all	
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line	X	Depositional Bars & Benches		Bedrock		Silt	Х
Stream Order	2	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder		Clay	X
Estimated Flow	0-1 gal/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	0-72 inches	Lake		Culvert	X	OHW Mark	X	Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	10-Jun feet	Pond				Riffle-Pool Sequences				Sand			

Aquatic Life:

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisı	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P	Present in Scour Hole	Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda	1)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	linea)		I	
Northern dusky salamander	I		Aquatic segme	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminth	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails	(Gastropod	a)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clan	ns (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P	Present	Freshwater mu	ssels (Unio	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P						were apparent on rocks on outskirts of scour hole. Fin an approximately 6.0' deep scour hole filled with water a
Riffle beetles (Elmidae)	P				the mouth of cul		
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common	= 11-24; Al	bundant = 25-99; V	ery Abunda	int = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	
Riffle-pool sequences common	X
≥ Second order stream	X

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	X Perennial	Intermittent	Ephemera

Date: 7/13/2016 Inves	vestigators: JY, KR
PADEP Stream Name/Code: UNT to Schuylkill River Exist	isting Use Chapter 93 Designation: WWF, MF
Current Weather: Sunny 80-90s Antec	tecedent Weather: Sunny

Current Weath	her: Sunny 80-	90s				Antecedent W	Veather:		Sunny				
Stream Hydrology	<u>a</u>	<u>Hydrology</u> apply):	y Source(s)	(check all	that	Channel Conditio	ns (check	all that apply):		<u>Common >20%):</u>	Substrate T	ype(s) (check	k all_
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble		Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	6 to 8 feet	Pond				Riffle-Pool Sequences				Sand			

Aquatic Life:

Aquatic Life: Organism	Indicator	Abundance (Rare, Present, Common, Abundant,		Organism	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
-		Very Abundant)				Abundance (Rate, Fresent, Common, Abundant, Very Abundan	
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Platyhelminthes)		I		
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	a)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unio	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				No macroinverte during precipitat		observed. MB3 is a roadside ditch that collects runoff
Riffle beetles (Elmidae)	P				during precipitat	ion events.	
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; At	oundant = 25-99; V	ery Abunda	unt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	X

Determination:	Perennial	Intermittent	X	Ephemeral
				_

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Stream Name: MB4		Project/Task Number: 216040.01	
Date: 7/13/2016		Investigators: JY, KR	
PADEP Stream Name/Code:	UNT to Schuylkill	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 80-90s		Antecedent Weather: Sunny	
Stream Hydrology:	Hydrology Source(s) (check all that	Channel Conditions (check all that apply):	Common Substrate Type(s) (check all

Current Weat	her: Sunny 8	80-90s				Antecedent W	Veather:	,	Sunny				
Stream Hydrology: Hydrology Source(s) (check all that apply):				Channel Conditions (check all that apply): Common Substrate Type(s) (check all >20%):					t all				
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	
Stream Order	2	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	X	Clay	
Estimated Flow	<1 gal/min	Run-off	X	Outfall	X	Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	8 to 16 feet	Pond				Riffle-Pool Sequences	X			Sand			

Aquatic Life:

Aquatic Life:							
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	1	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Decap	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails ((Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				A macroinverteb	rate study w	as not conducted.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	
Solid blue line on USGS map	
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	
Alluvial bars & benches common	
Riffle-pool sequences common	
≥ Second order stream	X

Intermittent					
Very low flow or dry channel during summer/fall	Х				
I > P Indicators					
I > P (No. Organisms)					
Only "I" salamanders present					
Broken blue line on USGS map					
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3					
Channel grain size > floodplain	X				
Alluvial bars & benches present					
Riffle-run habitat common, well- developed pools uncommon	Х				
First or second order stream X					
Watershed >10acres but <40 acres					

Dry channel during winter/spring
Flow only in response to rainfall
Little or no aquatic life
Erosional channel/lacks alluvuial deposits
Terrestrial vegetation in channel
Channel filled with leaves/debris
Bank soils at OLW: matrix chroma ≥ 3
Channel grain size = floodplain
First order, headwater stream
Dendritic pattern on USGS
Watershed <10 acres

Determination:	Perennial	X Intermittent	Ephemeral

				STRE	AM DE	TERMI	NATION FIE	LD DA	TA FORM					
Stream Name	e: MB5	-					Project/Task	Number	r:	216040.	.01	-		
Date:	7/13/2016	-					Investigators	s:	JY, KR			-		
PADEP Stream Name/Code: UNT to Schuylkill River		r	Existing Use	Chapter	r 93 Designatio	on:	V	VWF, MF						
Current Weat	ther: Sunny	80-90s	-		-	-	Antecedent V	Weather:	:	Sunny				
Stream Hydrology	<u>y:</u>		Hydrology apply):	y Source(s	s) (check all	that	Channel Conditi	ions (check	all that apply):		<u>Common St</u> ≥20%):	Substrate Type	e(s) (check	<u>k all</u>
Watershed Area	acres	s	Spring		Wetland		USGS Solid Blue Line	;	Depositional Bars & Benches		Bedrock	Sil	ılt	X
Stream Order	1	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder	Cla	lay	X
Estimated Flow	gal/mir	n	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble	De	etritus	X
Water Depth	inches	s	Lake		1		OHW Mark		Terrestrial Vegetation	X	Gravel	Ar	rtificial	——————————————————————————————————————
TOB Width	4 fee	t	Pond	<u> </u>	1		Riffle-Pool Sequences		Vegenation		Sand		_	
Aquatic Life:		-			_				,					
0	Organism	m Indicator Abundance (Rare, Present, Common, Abundant Very Abundant)		n, Abundant,		Organism	1	Indicator	Abundance (Rare, Present,	, Common, Abı	undant, Ver	y Abundant		
Fish		P	very Abditionally		Scuds (Amphipoda) I			I						
Spring salamander	er	P					Aquatic sowbugs (Isopoda)		,	I				
Northern two-line	d salamander	P					Crayfish (Decap	oda)		P				
Seal salamander		P					Leeches (Hirudin	nea)		I				
Northern dusky sa	alamander	I					Aquatic segment	ted worms	(Oligochaeta)	I				
Mountain dusky s	salamander	I					Flatowrms (Platy	yhelminthe	:s)	I				
Mayfly nymphs (I	Ephemeroptera)	P					Aquatic snails (C	Gastropoda`	1)	P/I				
Stonefly nymphs ((Plecoptera)	P					Fingernail clams	s (Sphaeriid	Jae)	P/I				
Caddisfly larvae ((Tricoptera)	P					Freshwater muss	sels (Union	iidae)	I				
Midge larvae (Chi	ironomidae)	P/I					1							
Black fly larvae (S	Simulidae)	I					Photograph	View			Notes			
Cranefly larvae (T	Γipulidae)	P					1		No macroinverteb	brates were	observed.			ļ
Riffle beetles (Eln	midae)	P							1					ļ
Water pennies (Ps	sephenidae)	P							1					ļ
Aquatic beetles (C	Coleoptera)	P							1					ļ
Water bugs (Hemi	riptera)	P							1					ļ
Dobsonfly larvae	(Corydalidae)	P					1		1					
Alderfly larvae (S	Sialidae)	P							1					

Damselfly nymphs (Zygoptera)

Dragonfly nymphs (Anisoptera)

Perennial						
Bivalves (mussels or clams)						
≥ 5 "P" maroinvertebrate taxa						
"P" salamanders and/or fish						
>10% cover by SAV, periphyton						
Flowing during summer/fall						
Solid blue line on USGS map						
Streams fed by springs or outflow from lake or large pond						
P > I (No. Organisms)						
P > I No. Indicators						
Bank soils at OLW are gley						
Channel grain size >> floodplain						
Alluvial bars & benches common						
Riffle-pool sequences common						
≥ Second order stream						

P

P

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Intermittent					
Very low flow or dry channel during summer/fall					
I > P Indicators					
I > P (No. Organisms)					
Only "I" salamanders present					
Broken blue line on USGS map					
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3					
Channel grain size > floodplain					
Alluvial bars & benches present					
Riffle-run habitat common, well- developed pools uncommon					
First or second order stream	X				
Watershed >10acres but <40 acres					

Ephemeral						
Dry channel during winter/spring						
Flow only in response to rainfall	X					
Little or no aquatic life	X					
Erosional channel/lacks alluvuial deposits	X					
Terrestrial vegetation in channel	X					
Channel filled with leaves/debris	X					
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$						
Channel grain size = floodplain	X					
First order, headwater stream	X					
Dendritic pattern on USGS						
Watershed <10 acres	X					

Determination:	Perennial	Intermittent	X	Ephemera
				-

STREAM DETERMINATION FIELD DATA FORM											
Stream Name	: MB6					Project/Task Nur	mber:	216040.01			
Date:	7/13/2016					Investigators:	JY, KR				
PADEP Stream Name/Code: UNT to Schuylkill River				Existing Use Cha	Existing Use Chapter 93 Designation: WWF, MF						
Current Weat	her: Sunny 80-	90s				Antecedent Weat	ther:	Sunny			
Stream Hydrolog	<u>y:</u>	Hydrology apply):	Source(s) (check all	that	Channel Conditions (c	check all that apply):		Common Subst	trate Type(s) (chec	k all
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line	Depositional Bars & Benches		Bedrock	Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line	Eroded Channel	Х	Boulder	Clay	X
Estimated Flow	gal/min	Run-off	X	Outfall		Continuous Bed & Banks	Debris-filled	X	Cobble	Detritus	Х
Water Depth	inches	Lake				OHW Mark	Terrestrial Vegetation	х	Gravel	Artificial	
TOB Width	4 feet	Pond				Riffle-Pool Sequences			Sand		
Aquatic Life:											

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriic	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	
Solid blue line on USGS map	
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	
Alluvial bars & benches common	
Riffle-pool sequences common	
≥ Second order stream	

Intermittent	
Very low flow or dry channel during summer/fall	
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

X
X
X
X
X
X
X
X

Determination:	Perennial	Intermittent	X	Ephemeral
				_

Stream Name	e: MB	₹7			DIKL	ANI DE	ERWIN	Project/Task			216040.				
	7/13/2016							-		JY, KR	210070.				
								,							
PADEP Stream	ım Name/Code			UNT to	Schuylk	kill River	:	Existing Use	Chapter	: 93 Designation	n:	W	VWF, M	<u>IF</u>	
Current Weat	her: Sun	ıny 8	80-90s				Antecedent V	Neather:	:	Sunny					
Stream Hydrology	<u>y:</u>			Hydrology apply):	Source(s)	(check all t	that	Channel Condition	ons (check	all that apply):		<u>Common Su</u> >20%):	ubstrate 7	Type(s) (check	k all
Watershed Area		acres		Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order				Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	
Estimated Flow	ga	al/min		Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled		Cobble	X	Detritus	
Water Depth	i	inches		Lake		1		OHW Mark		Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	6	feet		Pond		_		Riffle-Pool Sequences				Sand	X] '	
Aquatic Life:															
0	Organism Indicator Abundance (Rare, Present, Common, Abundan Very Abundant)			ı, Abundant,	,	Organism		Indicator	Abundance (Rare, Present,	, Common,	, Abundant, Ver	ry Abundant			
Fish			P					Scuds (Amphipoda) I							
Spring salamande	r		P					Aquatic sowbugs	s (Isopoda)	i	I				
Northern two-line	d salamander		P					Crayfish (Decape	oda)		P				
Seal salamander			P					Leeches (Hirudir	nea)	I					
Northern dusky sa	alamander		I					Aquatic segmented worms (Oligochaeta)							
Mountain dusky s	alamander		I					Flatowrms (Platyhelminthes)							
Mayfly nymphs (I	Ephemeroptera)		P					Aquatic snails (C	Aquatic snails (Gastropoda) P/I						
Stonefly nymphs ((Plecoptera)		P	<u>[</u>				Fingernail clams	(Sphaeriid	lae)	P/I				
Caddisfly larvae (Tricoptera)		P					Freshwater muss	els (Union	idae)	I				
Midge larvae (Chi	ironomidae)		P/I	<u>[</u>											
Black fly larvae (S	Simulidae)		I					Photograph	View			Notes			
Cranefly larvae (T	l'ipulidae)		P							A macroinvertebrate study was not conducted.					
Riffle beetles (Elm	nidae)		P							1					
Water pennies (Ps	sephenidae)		P							1					
Aquatic beetles (C	Coleoptera)		P							1					
Water bugs (Hemi	iptera)		P												
Dobsonfly larvae	(Corydalidae)		P							=					
Alderfly larvae (S	sialidae)		P							=					
Damselfly nymph	ıs (Zygoptera)		P			-				1					

Dragonfly nymphs (Anisoptera)

P

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent				
Very low flow or dry channel during summer/fall	X			
I > P Indicators				
I > P (No. Organisms)				
Only "I" salamanders present				
Broken blue line on USGS map				
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3				
Channel grain size > floodplain	X			
Alluvial bars & benches present				
Riffle-run habitat common, well- developed pools uncommon	Х			
First or second order stream	X			
Watershed >10acres but <40 acres				

Ephemeral				
Dry channel during winter/spring				
Flow only in response to rainfall				
Little or no aquatic life	X			
Erosional channel/lacks alluvuial deposits	X			
Terrestrial vegetation in channel				
Channel filled with leaves/debris				
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$				
Channel grain size = floodplain				
First order, headwater stream	X			
Dendritic pattern on USGS				
Watershed <10 acres				

Determination:	Perennial	X Intermittent	Ephemeral
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				STRE	AM DE	FERMI	NATION FIE	LD DAT	TA FORM					
Stream Name	:: MB8						Project/Task	Number	:	216040.	.01			
Date:	7/13/2016						Investigators	:	JY, KR					
PADEP Strea	m Name/Code:		UNT to	Schuyl	kill River	r	Existing Use	Chapter	93 Designation	n:	V	WF, M	ЛF	
Current Weat	her: Sunny	80-90s					Antecedent V	Veather:		Sunny				
Stream Hydrology:			Hydrology apply):	Source(s	s) (check all	that_	Channel Conditions (check all that apply): ≥20%):				ubstrate ?	Type(s) (chec	k all	
Watershed Area	acres	3	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order			Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	X
Estimated Flow	gal/mir	1	Run-off	X	Outfall	X	Continuous Bed		Debris-filled		Cobble		Detritus	
Water Depth	inches		Lake				& Banks OHW Mark		Terrestrial		Gravel	X	Artificial	
TOB Width	4 to 8 fee		Pond				Riffle-Pool Sequences		Vegetation		Sand			
		_					Sequences		T					
Aquatic Life:	Organism	Indicator	Abundance		sent, Commor	n, Abundant,		Organism		Indicator	Abundance (Rare, Present	Common	Abundant Ve	rv Abundant
Fish	ngamsm	P		Very A	Abundant)		Scuds (Amphipoda)			I	Abundance (Kare, Fresenc	, Common,	, Abundant, ve	ry Abundani
Spring salamande	er	P					Aquatic sowbugs		I					
Northern two-line		P					Crayfish (Decapoda)			P				
Seal salamander		P					Leeches (Hirudinea) I							
Northern dusky sa	alamander	I					Aquatic segment	ed worms ((Oligochaeta)	I				
Mountain dusky s	salamander	I					Flatowrms (Platy	helminthes	s)	I				
Mayfly nymphs (Ephemeroptera)	P					Aquatic snails (C	astropoda))	P/I				
Stonefly nymphs	(Plecoptera)	P					Fingernail clams	(Sphaeriid	ae)	P/I				
Caddisfly larvae ((Tricoptera)	P					Freshwater muss	els (Unioni	idae)	I				
Midge larvae (Ch	ironomidae)	P/I												
Black fly larvae (Simulidae)	I					Photograph	View			Notes	-		
Cranefly larvae (7	Γipulidae)	P							A macroinvertebre that runs under R		as not conducted. Water	rcourse or	riginates fron	n a culvert
Riffle beetles (Eli	midae)	P								,				
Water pennies (Psephenidae) P		P												
Aquatic beetles (Coleoptera) P		P												
Water bugs (Hemiptera) P		P												
Dobsonfly larvae (Corydalidae) P		P												
Alderfly larvae (S	Sialidae)	P												
Damselfly nymph	as (Zygoptera)	P												
Dragonfly nymph	ıs (Anisoptera)	P												

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

 $Rare = 1\text{-}3; Present = 4\text{-}10; Common = 11\text{-}24; Abundant = 25\text{-}99; Very \ Abundant = 100\text{+}10\text{-}1$

Ephemeral					
Dry channel during winter/spring					
Flow only in response to rainfall					
Little or no aquatic life	X				
Erosional channel/lacks alluvuial deposits					
Terrestrial vegetation in channel					
Channel filled with leaves/debris	X				
Bank soils at OLW: matrix chroma ≥ 3					
Channel grain size = floodplain	X				
First order, headwater stream	X				
Dendritic pattern on USGS					
Watershed <10 acres					

Determination:	Perennial	X Intermittent	Ephemeral
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Stream Name: ME2	Project/Task Number: 216040.01	
Date: 8/10/2016	Investigators: JY, KR	
PADEP Stream Name/Code: UNT to Schuylkill River	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 80-90s	Antecedent Weather: Sunny	

Current Weather: Sunny 80-90s							Antecedent V	Veather:		Sunny				
Stream Hydrology	<u>/:</u>		<u>Hydrology</u> <u>apply):</u>	Source(s)	(check all	that	Channel Condition	ons (check	all that apply):		Common So >20%):	ubstrate T	ype(s) (check	k all
Watershed Area		acres	Spring		Wetland	Х	USGS Solid Blue Line	X	Depositional Bars & Benches	X	Bedrock		Silt	X
Stream Order	1		Seep	X	Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder	X	Clay	X
Estimated Flow	25-50	gal/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled		Cobble	X	Detritus	
Water Depth	6 to 72	inches	Lake				OHW Mark	X	Terrestrial Vegetation		Gravel	X	Artificial	
TOB Width	4 to 20	feet	Pond	X			Riffle-Pool Sequences	X			Sand			

Aquatic Life:

Aquatic Life:		Abundance (Rare, Present, Common, Abundant,	T				1
Organism	Indicator	Very Abundant)	Organism		Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant	
Fish	P	Abundant	Scuds (Amphipoda)		I		
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	tyhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clams (Sphaeriidae)		P/I		
Caddisfly larvae (Tricoptera)	P		Freshwater mussels (Unionidae)		I		
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				Fish were observ	ed to be livi	ing in watercourse.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P	Present - Water Striders					
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	; AV - Aquat	ic Vegetation Rare = 1-3; Present =	= 4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	X
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	X
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	X
Alluvial bars & benches common	X
Riffle-pool sequences common	X
≥ Second order stream	X

Intermittent	
Very low flow or dry channel during summer/fall	
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well-developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	x	Perennial	Intermittent	Ephemera
			 4	 _

Stream Hydrology		Hydrology Source(s) (check all that	Channel Canditions (about all that annly)		Common Substrate Type(s) (check all
Current Weather:	Sunny 70s	·	Antecedent Weather:	Sunny	·
PADEP Stream Name	/Code:	UNT to Schuylkill River	Existing Use Chapter 93 Designati	on:	WWF, MF
Date: 10/5/20	16		Investigators: JY, PS		
Stream Name:	ME3		Project/Task Number:	216040.01	

Stream Hydrology: Hydrology Source(s) (check				(check all	that	Channel Conditions (check all that apply):					Common Substrate Type(s) (check all			
	_	apply):				USGS Solid Blue		Depositional Bars		İ	>20%):		Ī I	
Watershed Area	acres	Spring		Wetland		Line		& Benches			Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X		Boulder	X	Clay	X
Estimated Flow	0 gal/min	Run-off	Х	Outfall		Continuous Bed & Banks		Debris-filled	X		Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X		Gravel	X	Artificial	
TOB Width	4 to 6 feet	Pond				Riffle-Pool Sequences					Sand			

Aquatic Life:

Aquatic Life:		Abundance (Rare, Present, Common, Abundant,	-				
Organism	Indicator	Very Abundant)		Organism	l .	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirudinea)		I		
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriio	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			Notes
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	Х
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix $chroma \ge 3$	
Channel grain size = floodplain	
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	Intermittent	X	Ephemeral
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Stream Name: NA2	Project/Task Number: 216040.01	
Date: 10/5/2016	Investigators: JY, PS	
PADEP Stream Name/Code: UNT to Schuylkill River	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 70s	Antecedent Weather: Sunny	

Stream Hydrology	Hydrology apply):	Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):				<u>Common Su</u> >20%):	Substrate Type(s) (check all			
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	
Estimated Flow	0 gal/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled	X	Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	2 to 4 feet	Pond				Riffle-Pool Sequences				Sand			

Aquatic Life:

Aquatic Life:		1					T
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbu	gs (Isopoda)	I	
Northern two-lined salamander	P		Crayfish (Deca	poda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	nted worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Pla	tyhelminthe	es)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda	1)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaerii	dae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	ssels (Unior	nidae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte property parking		observed. Watercourse collects run-off from Nassau
Riffle beetles (Elmidae)	P				property paramg	. 101	
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquati	ic Vegetation Rare = 1-3; Present =	4-10; Common :	= 11-24; At	oundant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	
Channel filled with leaves/debris	
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	
Channel grain size = floodplain First order, headwater stream Dendritic pattern on USGS	X

Determination:	Perennial	X I	ntermittent	Ephemeral

Stream Name: NA3	Project/Task Number: 216040.01	
Date: 10/5/2016	Investigators: JY, PS	
PADEP Stream Name/Code: UNT to Schuylkill River	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 70s	Antecedent Weather: Sunny	

Stream Hydrology: Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):				<u>Common So</u> >20%):	Common Substrate Type(s) (check all >20%):					
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Boulder		Clay	
Estimated Flow	0 gal/min	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobble		Detritus	X
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	4 to 6 feet	Pond				Riffle-Pool Sequences				Sand	X		

Aquatic Life:

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriic	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	
	1

Determination:	Perennial	Intermittent	X	Ephemeral
				_

Date: 9/22/2016	INT to Colombill Discon	Investigators: JY, PS	.	WINE ME
PADEP Stream Name/Code: Current Weather: Sunny 80-90s	UNT to Schuylkill River	Existing Use Chapter 93 Designa Antecedent Weather:	Sunny	WWF, MF
Current weather. Summy 60-708	Hudnology Connec(g) (about all that	Antecedent Weather.	Buility	Common Substrate Type(s) (abade all

Current Weath	ner: Sunny 80)-90s				Antecedent V	Veather:		Sunny				
Stream Hydrology: Hydrology Source(s) (check all that apply):				Channel Conditions (check all that apply):				<u>Common S</u> >20%):	Common Substrate Type(s) (check all >20%):				
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder		Clay	X
Estimated Flow	0 gal/min	Run-off	X	Outfall		Continuous Bed & Banks	X	Debris-filled	X	Cobble		Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	4 to 10 feet	Pond				Riffle-Pool Sequences			_	Sand	X		

Aquatic Life:

Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organisn	n	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant		
P		Scuds (Amphip	oda)		I			
P		Aquatic sowbu	gs (Isopoda)	I			
P		Crayfish (Deca	poda)		P			
P		Leeches (Hirud	inea)		I			
I		Aquatic segme	nted worms	(Oligochaeta)	I			
I		Flatowrms (Pla	tyhelminthe	es)	I			
P		Aquatic snails	(Gastropoda	1)	P/I			
P		Fingernail clams (Sphaeriidae)			P/I			
P		Freshwater mussels (Unionidae)		I				
P/I								
I		Photograph	View			Notes		
P						observed. Watercourse runs from culvert under SR 724 A2 is documented as a solid blue line, but field condition		
P				appear to indicate	e that the wa	atercourse was re-routed via a culvert and was		
P				intermittent.	ted affectin	g the flow. Therefore, the watercourse was considered		
P								
P				1				
P								
P								
P								
P								
AV - Aquati	ic Vegetation Rare = 1-3; Present =	= 4-10; Common	= 11-24; Ab	oundant = 25-99; V	ery Abunda	int = 100+		
	P P P P P I I P P P P P P P P P P P P P	Indicator Very Abundant) P	Indicator P Scuds (Amphip Aquatic sowbu, Aquatic sowbu, P Leeches (Hirud I Aquatic segmen I Flatowrms (Pla P Aquatic sails d P Fringernail clar P Freshwater mus P/I I P P P P P P P P P P P P P P P P P P	Indicator Very Abundant) P Scuds (Amphipoda) Aquatic sowbugs (Isopoda) P Leeches (Hirudinea) I Aquatic segmented worms I Flatowrms (Platyhelminthe P Aquatic snails (Gastropoda P Freshwater mussels (Union P/I I Photograph View P P P P P P P P P P P P P P P P P P	P Scuds (Amphipoda)	Indicator Very Abundant) P Scuds (Amphipoda) I Aquatic sowbugs (Isopoda) I P P Leeches (Hirudinea) I I Aquatic segmented worms (Oligochaeta) I I Flatowrms (Platyhelminthes) I Aquatic snails (Gastropoda) P/I P P Freshwater mussels (Unionidae) I I Photograph View P P P P P P P P P P P P P P P P P P P		

Perennial	
Bivalves (mussels or clams)	
≥ 5 "P" maroinvertebrate taxa	
"P" salamanders and/or fish	
>10% cover by SAV, periphyton	
Flowing during summer/fall	
Solid blue line on USGS map	X
Streams fed by springs or outflow from lake or large pond	
P > I (No. Organisms)	
P > I No. Indicators	
Bank soils at OLW are gley	
Channel grain size >> floodplain	
Alluvial bars & benches common	
Riffle-pool sequences common	
≥ Second order stream	

Intermittent	
Very low flow or dry channel during summer/fall	Х
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	X
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral						
X						
X						
X						
X						
X						
X						

Determination:	Perennial	X Intermittent	Ephemeral

				STRE	AM DE	TERMI	NATION FIE	LD DA	ΓA FORM					
Stream Name	: PA3						Project/Task Number:			216040.	01			
Date:	9/22/2016						Investigators	:	JY, KR					
PADEP Stream Name/Code: UNT to Schuylkill River			r	Existing Use	Chapter	93 Designation	n:	W	WF, M	1F				
Current Weather: Sunny 80-90s				Antecedent V	Weather:		Sunny							
Stream Hydrology: Hydrology Source(s) (check all the apply):			that_	Channel Conditions (check all that apply):				<u>Common Su</u> ≥20%):	ıbstrate T	Type(s) (chec	k all			
Watershed Area	acres		Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedrock		Silt	X
Stream Order	1		Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel		Boulder		Clay	X
Estimated Flow	gal/min		Run-off	Х	Outfall		Continuous Bed & Banks	X	Debris-filled	Х	Cobble		Detritus	
Water Depth	inches		Lake				OHW Mark		Terrestrial Vegetation	X	Gravel	X	Artificial	
TOB Width	8 to 10 feet		Pond				Riffle-Pool Sequences				Sand	X		
Aquatic Life:														
C	rganism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		n, Abundant,	Organism			Indicator	Abundance (Rare, Present,	Common,	Abundant, Ver	y Abundant	
Fish		P		•			Scuds (Amphipoda)			I				
Spring salamande	r	P					Aquatic sowbugs	s (Isopoda)		I				
Northern two-line	d salamander	P					Crayfish (Decap	oda)		P				
Seal salamander		P					Leeches (Hirudin	nea)		I				
Northern dusky sa	lamander	I					Aquatic segment	ed worms	(Oligochaeta)	I				
Mountain dusky s	alamander	I					Flatowrms (Platy	helminthe	s)	I				
Mayfly nymphs (Ephemeroptera)	P					Aquatic snails (C	Gastropoda)	P/I				
Stonefly nymphs	(Plecoptera)	P					Fingernail clams	(Sphaeriid	lae)	P/I				
Caddisfly larvae (Tricoptera)	P					Freshwater muss	els (Union	idae)	I				
Midge larvae (Ch	ironomidae)	P/I												
Black fly larvae (Simulidae)	I					Photograph	View			Notes			
Cranefly larvae (7	ipulidae)	P									observed. Watercourse r	uns from	culvert unde	r SR 724
Riffle beetles (Eli	nidae)	P					to culvert under Railroad.							

Water pennies (Psephenidae)

Aquatic beetles (Coleoptera)

Dobsonfly larvae (Corydalidae)

Damselfly nymphs (Zygoptera)

Dragonfly nymphs (Anisoptera)

Water bugs (Hemiptera)

Alderfly larvae (Sialidae)

P

P

P

P

P P

P

Indicator: P - Pernnial; I - Intermittent; AV - Aquatic Vegetation

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent
Very low flow or dry channel during summer/fall
I > P Indicators
I > P (No. Organisms)
Only "I" salamanders present
Broken blue line on USGS map
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3
Channel grain size > floodplain
Alluvial bars & benches present
Riffle-run habitat common, well-developed pools uncommon
First or second order stream
Watershed >10acres but <40 acres

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix chroma ≥ 3	
Channel grain size = floodplain	X
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

_				
Determination:	Perennial	Intermittent	X	Ephemeral

Stream Name: WN2		Project/Task Number: 216040.01	
Date: 10/5/2016		Investigators: JY, PS	
PADEP Stream Name/Code:	UNT to Schuylkill River	Existing Use Chapter 93 Designation:	WWF, MF
Current Weather: Sunny 70s		Antecedent Weather: Sunny	
	Hydrology Source(s) (check all that		Common Substrate Type(s) (check all

Current Weath	ner: Sunny 7	0s				Antecedent W	eather:		Sunny					
Stream Hydrology: Hydrology Source(s) (check all that apply):			Channel Conditions (check all that apply):					Common Substrate Type(s) (check all >20%):						
Watershed Area	acres	Spring		Wetland		USGS Solid Blue Line		Depositional Bars & Benches		Bedro	ock		Silt	X
Stream Order	1	Seep		Flowing Well		USGS Broken Blue Line		Eroded Channel	X	Bould	ler		Clay	
Estimated Flow	0 gal/min	Run-off	X	Outfall		Continuous Bed & Banks		Debris-filled	X	Cobb	le	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X	Grave	el .	X	Artificial	
TOB Width	4 to 8 feet	Pond				Riffle-Pool Sequences				Sand				

Aquatic Life:

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)	Organism		Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan	
Fish	P		Scuds (Amphipoda)		I		
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriic	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mussels (Unionidae)		I		
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	X
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well-developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

$\begin{tabular}{ll} \begin{tabular}{ll} \hline Dry channel during winter/spring \\ \hline Flow only in response to rainfall \\ \hline Little or no aquatic life & X \\ \hline Erosional channel/lacks alluvuial deposits & X \\ \hline Terrestrial vegetation in channel & X \\ \hline Channel filled with leaves/debris & X \\ \hline Bank soils at OLW: & matrix chroma ≥ 3 \\ \hline \end{tabular}$
Little or no aquatic life X Erosional channel/lacks alluvuial deposits X Terrestrial vegetation in channel X Channel filled with leaves/debris X Bank soils at OLW: matrix
Erosional channel/lacks alluvuial deposits X Terrestrial vegetation in channel X Channel filled with leaves/debris X Bank soils at OLW: matrix
Terrestrial vegetation in channel X Channel filled with leaves/debris X Bank soils at OLW: matrix
Channel filled with leaves/debris X Bank soils at OLW: matrix
Bank soils at OLW: matrix
Channel grain size = floodplain
First order, headwater stream X
Dendritic pattern on USGS
Watershed <10 acres

Determination:	Perennial	Intermittent	X	Ephemeral
				_

Stream Name:	WN3		Project/Task Number:	216040.01	
Date: 10/5/201	16		Investigators: JY, PS		
PADEP Stream Name/	Code:	UNT to Schuylkill River	Existing Use Chapter 93 Designation	ion:	WWF, MF
Current Weather:	Sunny 70s		Antecedent Weather:	Sunny	
		Hydrology Convec(s) (about all that			Common Substrate Type(s) (about all

Current Weat	her: Sunny 7	Us				Antecedent We	eather:		Sunny					
Stream Hydrology	(ydrology: Hydrology Source(s) (check all that apply);			Channel Conditions (check all that apply):			Common Substrate Type(s) (check all >20%):							
Watershed Area	acres	Spring	W	Wetland		USGS Solid Blue Line		Depositional Bars & Benches			Bedrock		Silt	X
Stream Order	1	Seep		lowing Well		USGS Broken Blue Line		Eroded Channel	X		Boulder	X	Clay	х
Estimated Flow	0 gal/min	Run-off	X O	Outfall		Continuous Bed & Banks		Debris-filled	X		Cobble	X	Detritus	
Water Depth	inches	Lake				OHW Mark		Terrestrial Vegetation	X		Gravel	X	Artificial	
TOB Width	4 to 6 feet	Pond				Riffle-Pool Sequences					Sand			

Aquatic Life:

Aquatic Life:	1						
Organism	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundant)		Organism	ı	Indicator	Abundance (Rare, Present, Common, Abundant, Very Abundan
Fish	P		Scuds (Amphip	oda)		I	
Spring salamander	P		Aquatic sowbug	gs (Isopoda))	I	
Northern two-lined salamander	P		Crayfish (Decap	ooda)		P	
Seal salamander	P		Leeches (Hirud	inea)		I	
Northern dusky salamander	I		Aquatic segmen	ited worms	(Oligochaeta)	I	
Mountain dusky salamander	I		Flatowrms (Plat	yhelminthe	s)	I	
Mayfly nymphs (Ephemeroptera)	P		Aquatic snails (Gastropoda)	P/I	
Stonefly nymphs (Plecoptera)	P		Fingernail clam	s (Sphaeriic	lae)	P/I	
Caddisfly larvae (Tricoptera)	P		Freshwater mus	sels (Union	idae)	I	
Midge larvae (Chironomidae)	P/I						
Black fly larvae (Simulidae)	I		Photograph	View			<u>Notes</u>
Cranefly larvae (Tipulidae)	P				No macroinverte	brates were	observed.
Riffle beetles (Elmidae)	P						
Water pennies (Psephenidae)	P						
Aquatic beetles (Coleoptera)	P						
Water bugs (Hemiptera)	P						
Dobsonfly larvae (Corydalidae)	P						
Alderfly larvae (Sialidae)	P						
Damselfly nymphs (Zygoptera)	P						
Dragonfly nymphs (Anisoptera)	P						
Indicator: P - Pernnial; I - Intermittent;	AV - Aquat	ic Vegetation Rare = 1-3; Present =	4-10; Common =	= 11-24; Ab	undant = 25-99; V	ery Abunda	nt = 100+

Perennial
Bivalves (mussels or clams)
≥ 5 "P" maroinvertebrate taxa
"P" salamanders and/or fish
>10% cover by SAV, periphyton
Flowing during summer/fall
Solid blue line on USGS map
Streams fed by springs or outflow from lake or large pond
P > I (No. Organisms)
P > I No. Indicators
Bank soils at OLW are gley
Channel grain size >> floodplain
Alluvial bars & benches common
Riffle-pool sequences common
≥ Second order stream

Intermittent	
Very low flow or dry channel during summer/fall	Х
I > P Indicators	
I > P (No. Organisms)	
Only "I" salamanders present	
Broken blue line on USGS map	
Bank soils at OLW: matrix chroma 1-2 and mottle chroma ≥ 3	
Channel grain size > floodplain	
Alluvial bars & benches present	
Riffle-run habitat common, well- developed pools uncommon	
First or second order stream	X
Watershed >10acres but <40 acres	

Ephemeral	
Dry channel during winter/spring	
Flow only in response to rainfall	
Little or no aquatic life	X
Erosional channel/lacks alluvuial deposits	X
Terrestrial vegetation in channel	X
Channel filled with leaves/debris	X
Bank soils at OLW: matrix $\operatorname{chroma} \ge 3$	
Channel grain size = floodplain	х
First order, headwater stream	X
Dendritic pattern on USGS	
Watershed <10 acres	

Determination:	Perennial	Intermittent	X	Ephemera
				-

APPENDIX B
SITE PHOTOGRAPHS



1. LOOKING UPSTREAM AT AR5



2. LOOKING UPSTREAM AT HAY CREEK





3. LOOKING DOWNSTREAM AT SCHUYLKILL RIVER



4. LOOKING UPSTREAM AT MB1





5. VIEW OF MB2-SPW LOOKING SOUTHWEST



6. LOOKING UPSTREAM AT MB3





7. LOOKING UPSTREAM AT FR1



8. LOOKING DOWNSTREAM AT MB4





9. LOOKING UPSTREAM AT MB5



10. LOOKING UPSTREAM AT MB6





11. LOOKING UPSTREAM AT MB7



12. LOOKING UPSTREAM AT MB8





13. VIEW OF WN1 LOOKING NORTH-NORTHEAST



14. LOOKING UPSTREAM AT WN2





15. VIEW OF ARK7 LOOKING EAST



16. VIEW OF WETLAND ARK1 LOOKING NORTHEAST





17. LOOKING DOWNSTREAM AT ARK2



18. LOOKING DOWNSTREAM AT ARK3





19. LOOKING SOUTHWEST ACROSS ARK4



20. LOOKING DOWNSTREAM AT ARK5





21. LOOKING DOWNSTREAM AT ARK6



22. LOOKING AT ME1/ME2 COMPLEX





23. LOOKING DOWNSTREAM AT ME2-SCHUYLKILL CONFLUENCE



24. LOOKING UPSTREAM AT ME3





25. VIEW OF ME1 LOOKING NORTHEAST



26. LOOKING UPSTREAM AT NA2





27. LOOKING UPSTREAM AT NA3



28. VIEW OF WETLAND LI1 LOOKING SOUTHWEST





29. LOOKING UPSTREAM AT EX1 (HEISTERS CREEK)



30. LOOKING DOWNSTREAM AT EX2-SCHUYLKILL CONFLUENCE





31. VIEW OF WETLAND EX3 LOOKING NORTH



32. VIEW OF WETLAND FI1 LOOKING EAST





33. VIEW OF PA3 LOOKING SOUTH-SOUTHWEST TOWARD RAILROAD



34. VIEW OF PA2 LOOKING SOUTH TOWARDS RAILROAD





35. LOOKING DOWNSTREAM AT BR1



36. VIEW OF WETLAND BR2 LOOKING NORTH-NORTHEAST





37. LOOKING UPSTREAM AT EX4



38. LOOKING UPSTREAM AT BR3



REPORT

TO

Mr. James P. Palumbo, P.E. Emberclear, Corp. 72 Glenmaura National Boulevard Suite 104 Moosic, PA 18507

FOR

WETLAND DELINEATION REPORT BIRDSBORO COMBINED CYCLE PROPERTY

Birdsboro Borough and Union Township Berks County, Pennsylvania

Prepared By:

JAMES P. SPOSITO ASSOCIATES ENVIRONMENTAL AND GEOLOGICAL CONSULTANTS 11 Archbald Street Carbondale, PA 18407 Telephone: 570-282-2819

Fax: 570-282-5460

Date: March, 2016

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WETLAND DELINEATION REPORT BIRDSBORO COMBINED CYCLE PROPERTY BIRDSBORO BOROUGH AND UNION TOWNSHIP BERKS COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

The following is a wetland delineation report prepared for the Birdsboro Combined Cycle Property. The purpose of this wetland delineation was to identify, define and map wetland areas on an approximately 100 acre site that meet the requirements and criteria set forth in the U.S. Army Corps of Engineers (USACOE) Wetland Delineation Manual, Technical Report Y-87-1 and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Figure 1).

2.0 PHYSIOGRAPHY, GEOLOGY AND TOPOGRAPHY

TOPOGRAPHY

According to the U.S.G.S. Birdsboro, Pennsylvania Topographic Map the site is at an elevation of approximately 160 feet above sea level (Figure 1). The site consists of relatively flat terrain in the flood plain of Hay Creek and the Schuylkill River that has been historically used for industrial purposes. The topography slopes north toward the Schuylkill River located immediately adjacent the site. Both Hay Creek and the Schuylkill River are classified as a Cold Water Fishery (CWF) Migratory Fishes (MF) according to Chapter 93. Groundwater flow and surface water flow are both generally expected to follow the topography to the north. The nearest traditionally navigable waterway is the Schuylkill River immediately adjacent the site.

PHYSIOGRAPHY AND GEOLOGY

Berks County comprises an area of about 866 square miles. The county is made up of physiographic provinces that consist of the Great Valley Section, Reading Prong Section, and the Gettysburg Newark Lowland Section. The county is drained by the Schuylkill River and its tributaries and is part of the Delaware River Basin.

The site is located in the Gettysburg Newark Lowland Section. This section consists of rolling lowlands, shallow valleys, and isolated hills. The geologic structure is low monoclinal northwest dipping beds with the rock types consisting of red shale, siltstone, sandstone, conglomerate, and diabase.

Bedrock underlying the site is composed of Triassic Age Diabase. Diabase consists of dark gray medium to coarse grained labradorite and various pyroxenes occurring as dikes and sheets.

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3.0 SITE SOILS

The soil types throughout the site and wetland delineation area are listed by the Berks County Soil Survey as being characteristic of urban land, udorthents, Birdsboro silt loam, Lamington silt loam, and Gibraltar silt loam (Figure 2).

Urban land is level to moderately steep areas on broad uplands that are so obscured by buildings, roads and other structures that identification of the natural soil is not practical.

Udorthents consist of deep well drained to someone poorly drained soils on uplands, ridges, and side slopes in areas that have been stripped off. They are commonly near urban land. These soils can have a highly variable profile.

The Birdsboro series consists of very deep, well drained, and moderately well drained soils. The soils formed in old alluvial deposits derived from red sandstone, shale, and siltstone. They are on terraces and alluvial fans with convex slopes of 0 to 15 percent. In a typical profile the surface layer is 0 to 10 inches of dark brown (10YR 3/3) silt loam. From 10 to 19 inches is reddish brown (5YR 4/3) silty clay loam. From 19 to 28 inches is reddish brown (5YR 4/4) loam. From 28 to 39 inches is reddish brown (5YR 4/4) loam with common medium prominent yellowish brown (10YR 5/6) iron concentration and pale brown (10YR 6/3) iron depletion. From 39 to 46 inches is brown (7.5YR 4/4) sandy clay loam with many coarse prominent yellowish brown (10YR 5/6) iron concentration and light brownish gray (10YR 6/2) iron depletion. From 46 to 70 inches is reddish brown (5YR 5/4) very gravelly clay loam with common medium prominent yellowish brown (10YR 5/6) iron concentration and light brownish gray (10YR 6/2) iron depletion.

The Lamington series consists of very deep, poorly drained soils formed in old sediments derived primarily from red Triassic shale and sandstone. Slopes range from 0 to 3 percent. In a typical profile the surface layer is 0 to 8 inches of dark grayish brown (10YR 4/2) silt loam. From 8 to 11 inches is dark reddish gray (5YR 4/2) silt loam with common fine prominent red (2.5YR 4/6) masses of oxidized iron. From 11 to 17 inches is pinkish gray (5YR 7/2) silty clay loam with common fine prominent red (10R 4/6) and brown (7.5YR 5/4) masses of oxidized iron. From 17 to 32 inches is reddish gray (5YR 5/2) clay loam with few clay films on faces of peds; few prominent black (N 2/0) manganese coatings on faces of peds; common medium prominent light gray (N 7/0) iron depletion and strong brown (7.5YR 5/6) masses of oxidizes iron on faces of peds. From 32 to 46 inches is pinkish gray (5YR 6/2) cobbly loam with few distinct clay films on faces of peds; few prominent black (N 2/0) manganese coatings and concretions; many coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron and reddish brown (5YR 4/3) iron manganese masses on faces of peds. From 46 to 60 inches is stratified sand and gravel.

The Gibraltar series consists of very deep, well-drained soils formed in recent alluvium derived from coal washings deposited over alluvium from reddish sandstone, siltstone and shale. They are nearly level soils on floodplains. In a typical profile the surface layer

is 0 to 4 inches of very dark gray (10YR 3/1) silt loam. From 4 to 12 inches is very dark gray (10YR 3/1) silt loam. From 12 to 24 inches is black (N 2.5/0) silt loam. From 24 to 30 inches is black (N 2.5/0) sandy loam. From 30 to 38 inches is dark brown (7.5YR 3/2) silt loam. From 38 to 62 inches is reddish brown (5YR 5/4) silt loam.

Of the soils listed above Lamington soils are listed on the Hydric Soils of Pennsylvania List.

4.0 INTERSTATE WATERWAYS AND WETLAND AREAS ON THE PROPERTY

Wetlands on the property were delineated around four palustrine emergent wetlands on the south end of the property that appear to have a drainage connection to interstate waterways (Figure 4). According to the Birdsboro Topographic Map the area on the site containing the wetlands was once part of the Schuylkill Canal that ran along the south side of the Schuylkill River. Historic topographic maps for this area show the Schuylkill Canal connecting into Hay Creek to the west, and other smaller unnamed tributaries to the east. Throughout the 1900s urban development in the Birdsboro area steadily filled in portions of the Schuylkill Canal eliminating a visible hydraulic connection to Hay Creek. Based on areas developed to the east, it appears as though some of the smaller unnamed tributaries formerly hydraulically connected to the Schuylkill Canal may also no longer have a visible hydraulic connection. The four wetland areas are identified and discussed as follows with data sheets and photographs included in Appendices B and C, respectively. Topographic, National Wetland Inventory (NWI), and Soil Survey Maps are attached in Appendix A. The NWI did not identify wetlands on the site.

Wetland Area A

This wetland encompassed wetland delineation flags 83 to 100 and was determined to be 16,311 square feet or 0.374 acres. Wetland vegetation consisted of Phragmites (Reed Grass). Data collected in the field indicated saturated and inundated hydrology and hydric soil conditions. Data sheets from the wetland community and photographs are attached.

The Berks County Soil Survey identifies soils in the area of this wetland as being characteristic of udorthents.

Upland areas surrounding the wetland consisted of herbaceous vegetation consisting of strawberry, red fescue, and violets. Soils identified in upland areas appeared consistent with udorthents soils. Data sheets from the upland community are attached.

Wetland Area B

This wetland encompassed wetland delineation flags 44 to 82 and was determined to be 49,810 square feet or 1.14 acres. Wetland vegetation consisted of watercress, smart weed, and honey locust. Data collected in the field indicated saturated and inundated

hydrology and hydric soil conditions. Data sheets from the wetland community and photographs are attached.

The Berks County Soil Survey identifies soils in the area of this wetland as being characteristic of udorthents.

Upland areas surrounding the wetland consisted of herbaceous vegetation consisting of multiflora rose, mountain maple, and honey locust. Soils identified in upland areas appeared consistent with udorthents soils. Data sheets from the upland community are attached.

Wetland Area C

This wetland encompassed wetland delineation flags 1 to 26 and was determined to be 105,961 square feet or 2.43 acres. Wetland vegetation consisted of Phragmites (reed grass), and red maple. Data collected in the field indicated saturated and inundated hydrology and hydric soil conditions. Data sheets from the wetland community and photographs are attached.

The Berks County Soil Survey identifies soils in the area of this wetland as being characteristic of Lamington silt loam.

Upland areas surrounding the wetland consisted of herbaceous vegetation consisting of multiflora rose and rough golden rod. Soils identified in upland areas appeared consistent with udorthents soils. Data sheets from the upland community are attached.

Wetland Area D

This wetland encompassed wetland delineation flags 27 to 43 and was determined to be 12,161 square feet or 0.279 acres. Wetland vegetation consisted of multiflora rose, smartweed, violet, and sedge. Data collected in the field indicated saturated and inundated hydrology and hydric soil conditions. Data sheets from the wetland community and photographs are attached.

The Berks County Soil Survey identifies soils in the area of this wetland as being characteristic of Birdsboro silt loam.

Upland areas surrounding the wetland consisted of herbaceous vegetation consisting of multiflora rose, mountain maple, sycamore, and honey locust. Soils identified in upland areas appeared consistent with udorthents soils. Data sheets from the upland community are attached.

5.0 ISOLATED WETLAND AREAS

No isolated wetland areas were observed on the site.

6.0 PNDI SEARCH

A Pennsylvania Natural Diversity Inventory (PNDI) records review was conducted to check for known impacts on special concern species and resources for the site.

Based on the project location, the PA Game Commission, the PA Fish and Boat Commission, the PA Department of Conservation and Natural Resources, and the US Fish and Wildlife Service indicated no adverse impact to protected species.

7.0 CONCLUSIONS

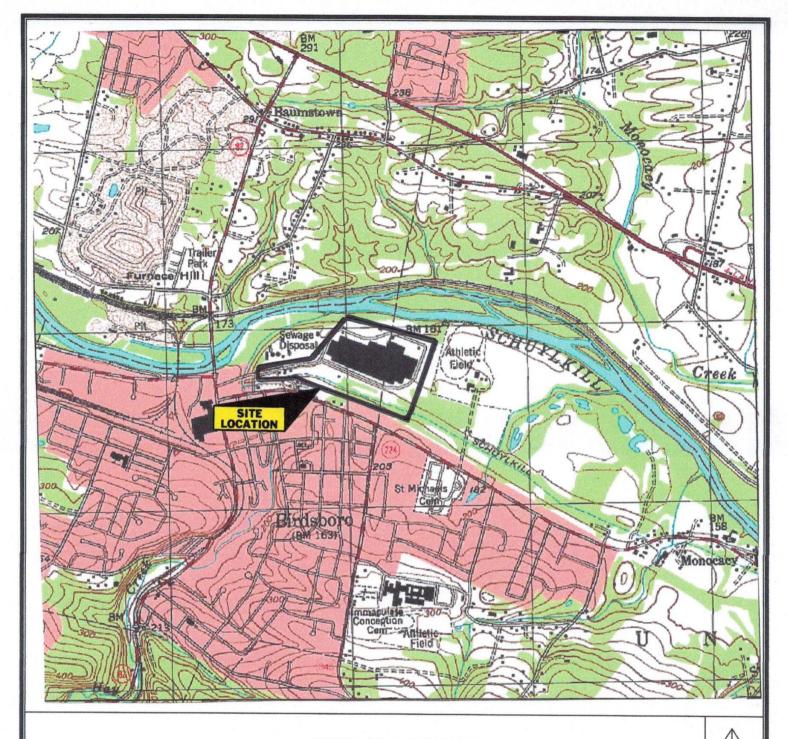
The result of this wetland delineation has identified a significant nexus of wetland areas to waters of the U.S. associated with four wetland areas. Wetland Area A encompassed wetland delineation flags 83 to 100 and was determined to be 16,311 square feet or 0.374 acres. Wetland Area B encompassed wetland delineation flags 44 to 82 and was determined to be 49,810 square feet or 1.14 acres. Wetland Area C encompassed wetland delineation flags 1 to 26 and was determined to be 105,961 square feet or 2.43 acres. Wetland Area D encompassed wetland delineation flags 27 to 43 and was determined to be 12,161 square feet or 0.279 acres. The site topography drains north toward the Schuylkill River. The Schuylkill River is classified as a Cold Water Fishery (CWF) Migratory Fishes (MF) under Chapter 93. Groundwater flow and surface water flow are both generally expected to follow the topography to the north.

Collectively, the site contains 184,243 square feet of wetlands or 4.223 acres.

A Pennsylvania Natural Diversity Inventory (PNDI) records review was conducted to check for known impacts on special concern species and resources for the site.

Based on the project location, the PA Game Commission, the PA Fish and Boat Commission, the PA Department of Conservation and Natural Resources, and the US Fish and Wildlife Service indicated no adverse impact to protected species.

APPENDIX A FIGURES



SITE LOCATION MAP U.S.G.S. TOPOGRAPHIC MAP PORTION OF BIRDSBORO QUADRANGLE

N

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11 ARCHBALD STREET CARBONDALE, PA 18407

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WETLAND DELINEATION REPORT BIRDSBORO COMBINED CYCLE PROPERTY BIRDSBORO AND UNION TOWNSHIP BERKS COUNTY, PENNSYLVANIA Date:

03/29/16

Drawn By:

J.S.

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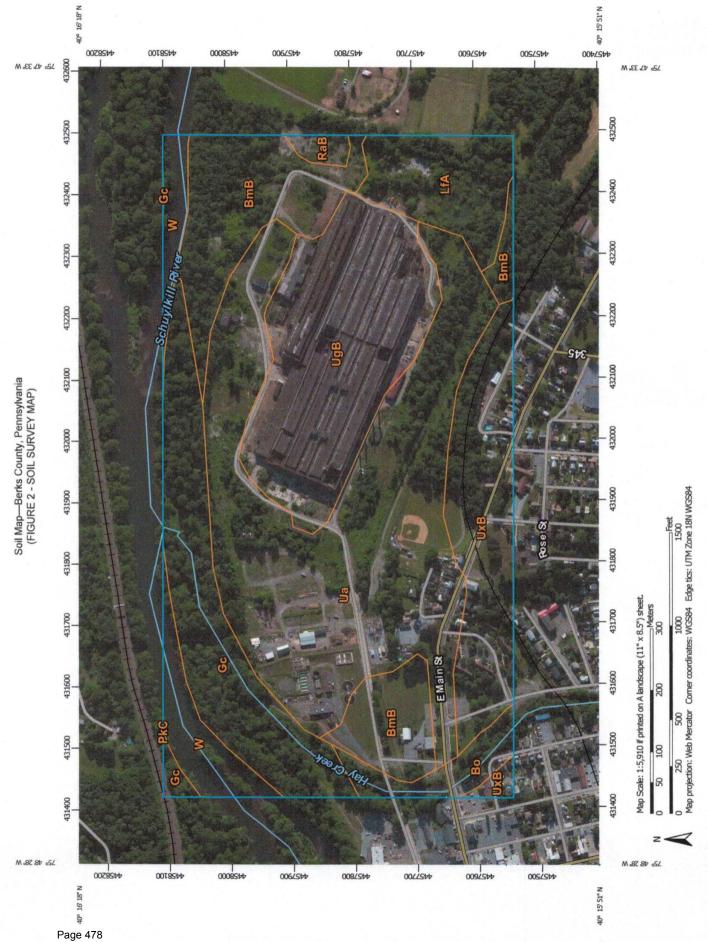
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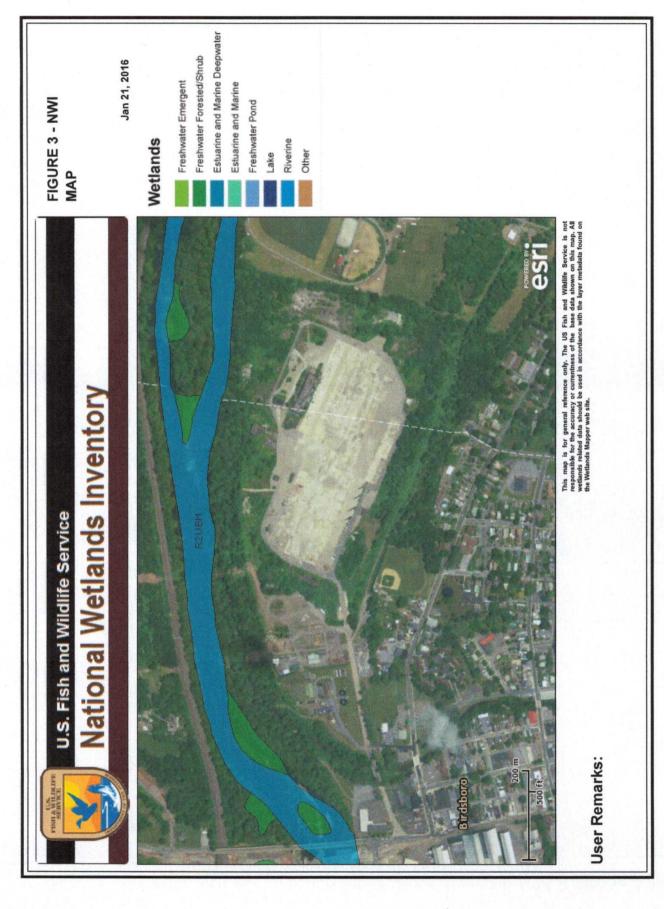
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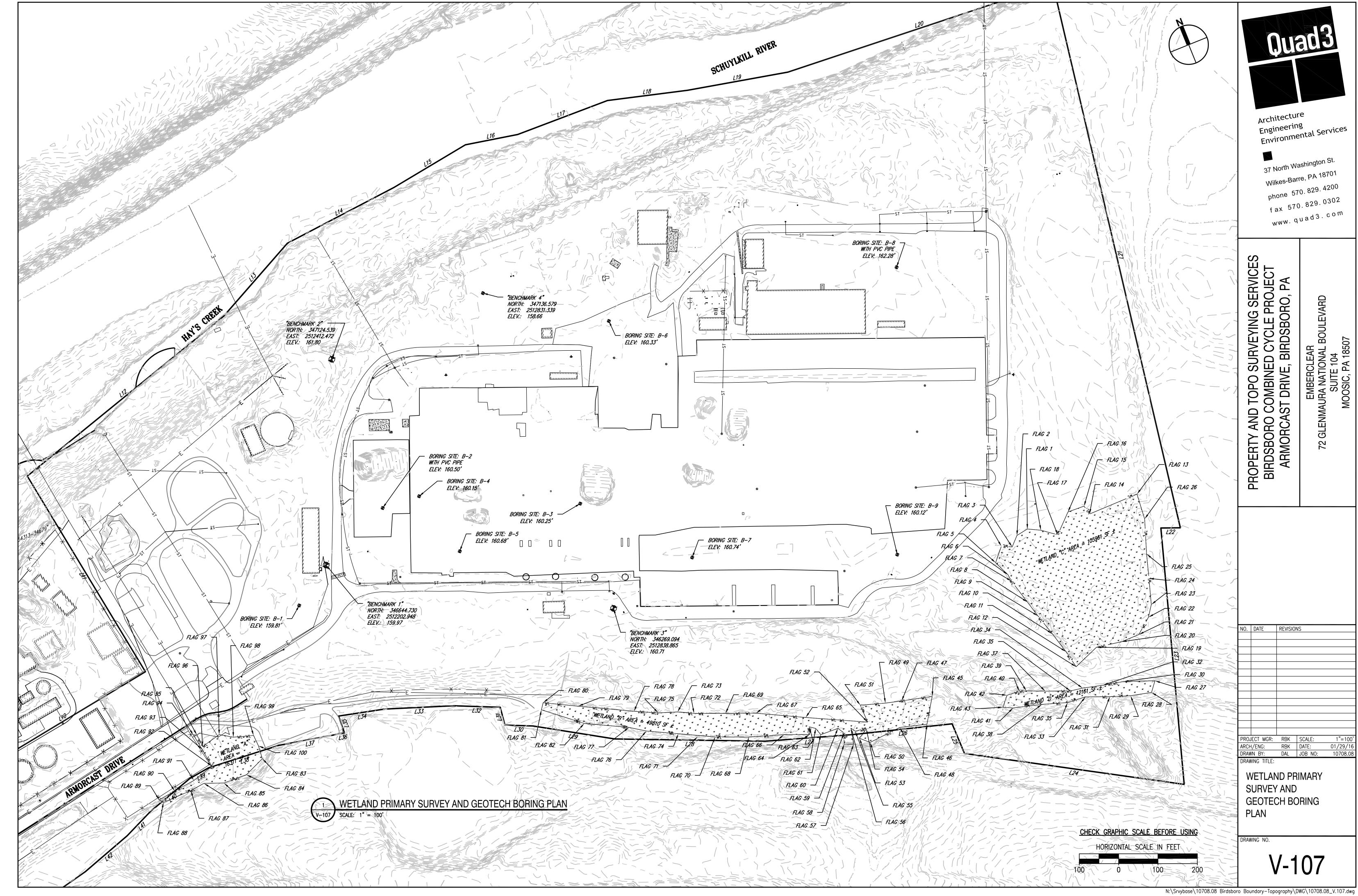
FIGURE 1



NSDA







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APPENDIX B
WETLAND DATA SHEETS

Applicant/Owner: En bettlern the provided city/country bit/bit/solone delices applied point application of the provided point of the	WETLAND DETERMINATION DATA FORM	- Eastern Mountains and Piedmont Region				
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Subregion (LRR or MLRA): Lat: Lat: Long: No. (If no explain in Remarks.) No. (If no explain in Remarks.) Are vegetation (M). Soil (M) or Hydrology (M) significantly disturbed? Are Vegetation (M). Soil (M) or Hydrology (M) naturally problematic? Revelogiation (M). Soil (M) or Hydrology (M) naturally problematic? SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? (Yes No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: Hydrophytic Vegetation Present? (Yes No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Soil Present? (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 1st he Sampled Area within a Wetland? Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Wetland Hydrology Indicators: No. 2sturday (No. 1st he Sampled Area within a Wetland?) Surface Water (A1) Sparsely Vegetated Concave Surface (B8) Drint Deposits (B3) Cracks (B6) No. 2sturday (No. 2st he No. 2st he	-1 - 0/40					
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Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) Hydrogen Sulfide Odor (C1) Saturation (A3) Water Marks (B1) Presence of Reduced Iron (C4) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water (A1) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Moss Trim Lines (B16) Dray-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	HYDROLOGY					
Usurface Water (A1)	Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)				
High Water Table (A2) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water Present? Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Noss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Crayfish Burrows (C8) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No	Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)				
Water Marks (B1)	Surface Water (A1) True Aquatic Plants	(B14) Sparsely Vegetated Concave Surface (B8)				
Water Marks (B1)		lor (C1) Drainage Patterns (B10)				
Sediment Deposits (B2)	✓ Saturation (A3) ✓ Oxidized Rhizospher	es on Living Roots (C3) Moss Trim Lines (B16)				
Drift Deposits (B3)	Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2)					
Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Stressed Plants (D1) Shallow Aquitard (D3) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Stunted or Stressed Plants (D1)	Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)					
Iron Deposits (B5)						
Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Aquatic Fauna (B13) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Wetland Hydrology Present? Yes No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:						
Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) No Depth (inches): Wetland Hydrology Present? Yes No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:						
Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (inches): No Depth (inches): Wetland Hydrology Present? Yes No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:						
Surface Water Present? Yes No Depth (inches): 6 Water Table Present? Yes No Depth (inches): 7 Saturation Present? Yes No Depth (inches): 7 (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	•	FAC-Neutral Test (D5)				
Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		6				
Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	the state of the s					
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	the state of the s	X				
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		wedand Hydrology Present? Yes No				
Remarks:		evious inspections), if available:				
Relians.	Domarks:					
	Remarks.					
		•				
그 그 그 그는 그는 그 그 그는 그들은 그들은 그는 그들은 그들은 그들은 사람들이 되었다면 하는 것이 되었다.						

/EGETATION (Five Strata) – Use scientific	GETATION (Five Strata) – Use scientific names of plants.			
Trace Charles (District	Absolute Dominant Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size:) 1ACEN Rubaum	% Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)		
2		Total Number of Dominant		
3		Species Across All Strata: (B)		
4		Percent of Dominant Species		
5 6		That Are OBL, FACW, or FAC:(_///(A/B)		
	= Total Cover	Prevalence Index worksheet:		
50% of total cover:	20% of total cover:	Total % Cover of: Multiply by:		
es and the second of the secon	20% of total cover:	OBL species x 1 =		
Sapling Stratum (Plot size:)		FACW species x 2 =		
1		FAC species x 3 =		
2		FACU species x 4 =		
3		UPL species x 5 =		
4 5		Column Totals: (A) (B)		
6		Prevalence Index = B/A = 2, /		
	= Total Cover	Hydrophytic Vegetation Indicators:		
50% of total cover:	20% of total cover:			
Shrub Stratum (Plot size:)		∆ 2 - Dominance Test is >50%		
1		3 - Prevalence Index is ≤3.0¹		
2		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)		
3 4		Problematic Hydrophytic Vegetation ¹ (Explain)		
5		1		
5		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
	= Total Cover	Definitions of Five Vegetation Strata:		
50% of total cover:	20% of total cover:	Tree – Woody plants, excluding woody vines,		
Herb Stratum (Plot size:) 1. PhRAG Mi tes AUSTNAGS	90 bes FACH	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).		
2		Sapling – Woody plants, excluding woody vines,		
3		approximately 20 ft (6 m) or more in height and less		
4		than 3 in. (7.6 cm) DBH.		
5 6		Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.		
7				
8		Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody		
		plants, except woody vines, less than approximately 3		
9		ft (1 m) in height.		
11		Woody vine – All woody vines, regardless of height.		
	= Total Cover			

50% of total cover: _____ 20% of total cover:__

50% of total cover: _____ 20% of total cover:_

_ = Total Cover

Woody Vine Stratum (Plot size: _____)

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic Vegetation Present?

-	-	
	•	

Sampling Point: Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Redox Features (inches Color (moist) Color (moist) % Type¹ Loc² Texture Remarks ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils3: ___ Histosol (A1) __ Dark Surface (S7) 2 cm Muck (A10) (MLRA 147) _ Histic Epipedon (A2) Coast Prairie Redox (A16) Polyvalue Below Surface (S8) (MLRA 147, 148) Black Histic (A3) _ Thin Dark Surface (S9) (MLRA 147, 148) (MLRA 147, 148) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Piedmont Floodplain Soils (F19) Stratified Layers (A5) Depleted Matrix (F3) (MLRA 136, 147) 2 cm Muck (A10) (LRR N) ___ Redox Dark Surface (F6) Very Shallow Dark Surface (TF12) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Other (Explain in Remarks) Thick Dark Surface (A12) ___ Redox Depressions (F8) ___ Sandy Mucky Mineral (S1) (LRR N, ___ Iron-Manganese Masses (F12) (LRR N, MLRA 147, 148) **MLRA 136)** Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) ³Indicators of hydrophytic vegetation and __ Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) wetland hydrology must be present, unless disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Restrictive Layer (if observed): Type: Depth (inches): _ Hydric Soil Present? Yes Remarks:

WETLAND DETERMINATION DATA FORM -	- Eastern Mountains and Piedmont Region
Applicant/Owner:	Are "Normal Circumstances" present? Yes No atic? (If needed, explain any answers in Remarks.)
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present? Remarks: Yes No Yes No Remarks:	Is the Sampled Area within a Wetland? Yes No
Water Marks (B1) Presence of Reduced Sediment Deposits (B2) Recent Iron Reductio Drift Deposits (B3) Thin Muck Surface (C) Algal Mat or Crust (B4) Other (Explain in Rer Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Aquatic Fauna (B13)	dor (C1)
Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	Wetland Hydrology Present? Yes No

	Absolute	Dominant	Indicator	Sampling Point:
Tree Stratum (Plot size:) 1		Species?		Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2				
3				Total Number of Dominant Species Across All Strata: (B)
4				Species Across All Strata: (B)
				Percent of Dominant Species 5096
5				That Are OBL, FACW, or FAC: (A/B)
6		= Total Cov	er	Prevalence Index worksheet:
EOV of total cover.				Total % Cover of: Multiply by:
50% of total cover:	20% 01	total cover:		OBL species x 1 =
Sapling Stratum (Plot size:)				FACW species x 2 =
1				FAC species 50 x 3 = 150
2				FACU species 50 x 4 = 70 0
3				UPL species x 5 =
4				Column Totals: 100 (A) 350 (B)
56				Prevalence Index = B/A = 3,5
		= Total Cov		Hydrophytic Vegetation Indicators:
50% of total cover:	20% of	total cover-		1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size:				2 - Dominance Test is >50%
1. ROSA MULTIFLORA	50	ves	FORU	3 - Prevalence Index is ≤3.0¹
2		7		4 - Morphological Adaptations ¹ (Provide supporting
3				data in Remarks or on a separate sheet)
4				Problematic Hydrophytic Vegetation¹ (Explain)
5				1
6				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		Total Cov	er	Definitions of Five Vegetation Strata:
50% of total cover:	20% of	total cover:		Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:)				approximately 20 ft (6 m) or more in height and 3 in.
1. SOLIDAGO PULUSA	_ >0_	705	pac	(7.6 cm) or larger in diameter at breast height (DBH).
2				Sapling – Woody plants, excluding woody vines,
3				approximately 20 ft (6 m) or more in height and less
4				than 3 in. (7.6 cm) DBH.
5				Shrub - Woody plants, excluding woody vines,
6				approximately 3 to 20 ft (1 to 6 m) in height.
7				Herb - All herbaceous (non-woody) plants, including
8				herbaceous vines, regardless of size, and woody
9				plants, except woody vines, less than approximately 3 ft (1 m) in height.
10				it (1 m) in neight.
11				Woody vine – All woody vines, regardless of height.
		Total Cov	er	
50% of total cover:	20% of	total cover		
Woody Vine Stratum (Plot size:)	20% 01	iolai covei.		
1				
2				
3				
4				
5				Hydrophytic
				Vegetation Present? Yes No
50% of total cover:	20% of	total cover:		Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling Point: 9

Profile Description: (Describe to the depth i	needed to document the indicator or confirm	the absence of indicators.)
Depth Matrix	Redox Features	
(inches) Color (moist) / %	Color (moist) % Type ¹ Loc ²	Texture Remarks
12 104R 3/3		GAMY GUAM
	:	
¹ Type: C=Concentration, D=Depletion, RM=Re	aduced Matrix MS_Macked Sand Crains	21 continue DI - Doro Lining M. Moteiu
Hydric Soil Indicators:	Jacoba Madia, Mid-Maskey Sally Glatis.	² Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils ³ :
	Dadi Cuface (CT)	The state of the s
Histosol (A1)	Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
Histic Epipedon (A2)	Polyvalue Below Surface (S8) (MLRA 147,	
Black Histic (A3)	Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Piedmont Floodplain Soils (F19)
Stratified Layers (A5)	Depleted Matrix (F3)	(MLRA 136, 147)
2 cm Muck (A10) (LRR N)	Redox Dark Surface (F6)	Very Shallow Dark Surface (TF12)
Depleted Below Dark Surface (A11)	Depleted Dark Surface (F7)	Other (Explain in Remarks)
Thick Dark Surface (A12)	Redox Depressions (F8)	
Sandy Mucky Mineral (S1) (LRR N,	Iron-Manganese Masses (F12) (LRR N,	
MLRA 147, 148)	MLRA 136)	
Sandy Gleyed Matrix (S4)	Umbric Surface (F13) (MLRA 136, 122)	³ Indicators of hydrophytic vegetation and
Sandy Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA 14	
Stripped Matrix (S6)	Red Parent Material (F21) (MLRA 127, 147	unless disturbed or problematic.
Restrictive Layer (if observed):		
Type:	_	
Depth (inches):		Hydric Soil Present? Yes No
Remarks:		
Normano.		
		in the second se
× **		
0		

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region Applicant/Owner: Investigator(s): Section, Township, Range: Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): Slope (%): 151 56,54" Long: 750 Subregion (LRR or MLRA): Datum: NAV Soil Map Unit Name: **NWI** classification: (If no, explain in Remarks.) No___ Are Vegetation _____, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation M, Soil W, or Hydrology M naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? No Is the Sampled Area Hydric Soil Present? within a Wetland? No Wetland Hydrology Present? Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) Sparsely Vegetated Concave Surface (B8) True Aquatic Plants (B14) High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) __ Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) __ Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) __ Dry-Season Water Table (C2) __ Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) __ Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) ___ Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) _ Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aguitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Yes No Depth (inches): Surface Water Present? Yes No Depth (inches): Water Table Present? Saturation Present? Yes ____ No ____ Depth (inches): Wetland Hydrology Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

VEGETATION (Five Strata) – Use scientific	names of p	olants.	Sampling Point: 34
		Dominant Indi	
Tree Stratum (Plot size:) 1			Number of Dominant Species
3			Total Number of Dominant Species Across All Strata: (B)
4 5			Percent of Dominant Species That Are OBL, FACW, or FAC:
6			Prevalence Index worksheet:
		= Total Cover	Total % Cover of: Multiply by:
50% of total cover:	20% of	total cover:	OBL species x 1 =
Sapling Stratum (Plot size:)			
1			FACW species x 2 = FAC species x 3 = 60
2			FACU species 40 x 4 = /60
3			UPL species x 5 =
4			Column Totals: (A) 260 (B)
5			
6			Prevalence Index = B/A = 7,6
		= Total Cover	Hydrophytic Vegetation Indicators:
50% of total cover:	20% of	total cover:	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size:)			2 - Dominance Test is >50%
1. RUSA MULTIFLORA	40	LES FOR	U 3 - Prevalence Index is ≤3.01
2. CORNYS SPP.		YES F	4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
3			Problematic Hydrophytic Vegetation ¹ (Explain)
4			
56			Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		Total Cover	Definitions of Five Vegetation Strata:
50% of total cover:	20% of	total cover:	Tree Woody plants evaluding weedy since
Herb Stratum (Plot size:) 1. Poly Comm Hy Dro Piper	30	yes a	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
2. VIOLA PAPILIONACEA	_10_	yes for	Sapling – Woody plants, excluding woody vines,
3. CAREX GPP.	_10_	yes a	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
5			Shrub – Woody plants, excluding woody vines,
6			approximately 3 to 20 ft (1 to 6 m) in height.
7			Herb – All herbaceous (non-woody) plants, including
8			herbaceous vines, regardless of size, and woody
9			plants, except woody vines, less than approximately 3
10			ft (1 m) in height.
11			Woody vine – All woody vines, regardless of height.
		Total Cover	
500/ of total across			
50% of total cover:	20% 01	total cover:	_
Woody Vine Stratum (Plot size:)			
1			
2			_
3			_
4			
5			Hydrophytic
		Total Cover	Vegetation /
50% of total cover:	20% of	total cover:	Present? Yes No
Remarks: (Include photo numbers here or on a separate	shoot)		

-		

Sampling Point: 34

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth Matr			x Features				
(inches) Color (moist) %	Color (moist)		Type ¹ Loc ²	Tex	ture	Remarks
17 104 W 21 3	2	54R314	20	b		5	ILA GAS
/ /							
	-					-	

-							
					_		
¹ Type: C=Concentration, D=	Depletion, RM=	Reduced Matrix, M	S=Masked S	and Grains.	² Loca	ition: PL=Pore Li	ning, M=Matrix.
Hydric Soil Indicators:							Problematic Hydric Soils ³ :
Histosol (A1)		Dark Surface	e (S7)				(A10) (MLRA 147)
Histic Epipedon (A2)				(S8) (MLRA 14	7, 148)		rie Redox (A16)
Black Histic (A3)				ILRA 147, 148)			147, 148)
Hydrogen Sulfide (A4)		Loamy Gleye)		Piedmont F	Floodplain Soils (F19)
Stratified Layers (A5)	_	∠ Depleted Ma					136, 147)
2 cm Muck (A10) (LRR I		Redox Dark		- \			ow Dark Surface (TF12)
 Depleted Below Dark Su Thick Dark Surface (A12 		Depleted Da Redox Depre		7)		Other (Exp	lain in Remarks)
Sandy Mucky Mineral (S				(F12) (LRR N,			
MLRA 147, 148)	., (MLRA 13		(1 12) (211111)			
Sandy Gleyed Matrix (S4	1)			RA 136, 122)		3Indicators of	hydrophytic vegetation and
Sandy Redox (S5)		Piedmont Flo	oodplain Soils	(F19) (MLRA	148)		rology must be present,
Stripped Matrix (S6)		Red Parent I	Material (F21	(MLRA 127, 1	47)	unless distu	rbed or problematic.
Restrictive Layer (if observ	ed):						
Туре:							4
Depth (inches):					Hyd	ric Soil Present?	? Yes No
Remarks:							

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region City/County: DiRDS BOM Applicant/Owner: Investigator(s): Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): ___ Slope (%): Long: 750 Lat: 4 Subregion (LRR or MLRA): _ Datum: AM thens! Soil Map Unit Name: **NWI** classification: Are climatic / hydrologic conditions on the site typical for this time of year? Yes _ (If no, explain in Remarks.) Are Vegetation 4, Soil 4, or Hydrology 4, significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? No Is the Sampled Area Hydric Soil Present? within a Wetland? No Wetland Hydrology Present? Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) ___ True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) __ Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) ___ Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) __ Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) __ Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) ___ Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) _ Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes _____ No ___ Depth (inches): Water Table Present? Wetland Hydrology Present? Saturation Present? No_ Depth (inches): __ (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

VEGETATION (Five Strata) – Use scientific	names of plants.	Sampling Point: 34
	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:) 1	% Cover Species? Status 20 49 FAW	Number of Dominant Species
3		Total Number of Dominant Species Across All Strata: (B)
56		Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
	= Total Cover	Prevalence Index worksheet:
EOO/ of total across		Total % Cover of: Multiply by:
Sapling Stratum (Plot size:)	20% of total cover:	OBL species x 1 =
1. ALLA SPORATUM	10 yes FACU-	FACW species 20 $x = 40$ FAC species 20 $x = 60$
2. GLEditSIA TRACANTYS	20 Yes FAC-	FACU species 60 $\times 4 = 240$
3		UPL species x 5 =
4		Column Totals: (A) (A) (B)
5		Column Totals: (A) (B)
6		Prevalence Index = B/A = 3,4
	= Total Cover	Hydrophytic Vegetation Indicators:
50% of total cover:	20% of total cover:	1 - Rapid Test for Hydrophytic Vegetation
Shruh Stratum (Plot size:		2 - Dominance Test is >50%
1. ROSA MULTIFLOMA	50 yes FACU	3 - Prevalence Index is ≤3.01
2		4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
3		Problematic Hydrophytic Vegetation ¹ (Explain)
4		
56		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	= Total Cover	Definitions of Five Vegetation Strata:
50% of total cover:	20% of total cover:	The state of the s
<u>Herb Stratum</u> (Plot size:) 1)		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
2		Sapling – Woody plants, excluding woody vines,
3 4		approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
5		Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
7		Herb – All herbaceous (non-woody) plants, including
8		herbaceous vines, regardless of size, and woody
9		plants, except woody vines, less than approximately 3
10		ft (1 m) in height.
11		Woody vine - All woody vines, regardless of height.
	= Total Cover	
50% of total cover-	20% of total cover:	
Woody Vine Stratum (Plot size:)	20% of total cover	
1		
2		
3		
4		
5.		
	= Total Cover	Hydrophytic
50% of total cover:	20% of total cover:	Vegetation Present? Yes No
Remarks: (Include photo numbers here or on a separate	sheet.)	

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_	α	
-		

Sampling Point: 34

Profile Desc	ription: (Describe to the dep	th needed to docum	ent the indicator	or confirm the	absence of indicators.)
Depth	Matrix	Redox	Features		
(inches)	Color (moist) %	Color (moist)	% Type ¹	Loc	Texture Remarks
12	7,54R3/2				silt GAM
	,				
	-				
¹ Type: C=C	oncentration, D=Depletion, RM	Reduced Matrix, MS	=Masked Sand Gra	ains. ² Lo	ocation: PL=Pore Lining, M=Matrix.
Hydric Soil					Indicators for Problematic Hydric Soils ³ :
Histosol	(A1)	Dark Surface	(S7)		2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		ow Surface (S8) (N	ILRA 147, 148	
	stic (A3)		face (S9) (MLRA 1		(MLRA 147, 148)
	en Sulfide (A4)	Loamy Gleyed			Piedmont Floodplain Soils (F19)
Stratified	d Layers (A5)	Depleted Matr			(MLRA 136, 147)
	ıck (A10) (LRR N)	Redox Dark S	urface (F6)		Very Shallow Dark Surface (TF12)
	d Below Dark Surface (A11)	Depleted Dark	Surface (F7)		Other (Explain in Remarks)
	ark Surface (A12)	Redox Depres			
	flucky Mineral (S1) (LRR N,		se Masses (F12) (LRR N,	
	A 147, 148)	MLRA 136	•		
	Gleyed Matrix (S4)		e (F13) (MLRA 13		³ Indicators of hydrophytic vegetation and
	Redox (S5)		odplain Soils (F19)		wetland hydrology must be present,
	Matrix (S6)	Red Parent M	aterial (F21) (MLR	A 127, 147)	unless disturbed or problematic.
	Layer (if observed):				
Type:					1
Depth (in	ches):			н	lydric Soil Present? Yes No
Remarks:	*				

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region City/County: Applicant/Owner: Investigator(s): Section, Township, Range: _ Landform (hillslope, terrace, etc.): FLOW Local relief (concave, convex, none): Subregion (LRR or MLRA): _ Long: Soil Map Unit Name: ___ Are climatic / hydrologic conditions on the site typical for this time of year? Yes __/_ (If no, explain in Remarks.) Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Is the Sampled Area Hydric Soil Present? within a Wetland? Yes No Wetland Hydrology Present? Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) Hydrogen Sulfide Odor (C1) _ Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Saturation (A3) ___ Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) ___ Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) _ Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) ___ Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) _ Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) _ Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) **Field Observations:** Surface Water Present? Depth (inches): Water Table Present? Depth (inches): Saturation Present? Depth (inches): _ Wetland Hydrology Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

VEGETATION (Five Strata) – Use scientific n	ames or	plants.		Sampling Point: 6 /
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Deminent
3				Total Number of Dominant Species Across All Strata: (B)
4				Species Across Air Strata.
5				Percent of Dominant Species (1)
6				That Are OBL, FACW, or FAC:(///) (A/B)
0				Prevalence Index worksheet:
		= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:	20% of	f total cover		
Sapling Stratum (Plot size:)				OBL species x 1 =
1. GleditsiA +RACAntlys	20	401	M-	FACW species x 2 =
2				FAC species
				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (A) (B)
5				1 1
6				Prevalence Index = B/A =
		= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover:	20% of	total cover-		
Shrub Stratum (Plot size:)	2070 01	total cover.		2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0¹
1				
2				 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
3				Problematic Hydrophytic Vegetation¹ (Explain)
4				Trostomado Tryatopriyae Vogetadon (Explain)
5				Indicators of hydric call and walled by delaying
6				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		= Total Cov		Definitions of Five Vegetation Strata:
50% of total cover:	20% of	total cover		Demilianis of Five Vegetation Strate.
				Tree - Woody plants, excluding woody vines,
1. NASTEM TUM OFFICINALE	40	SPS	OBL	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
		yes	Nal	(7.0 cm) of larger in diameter at breast height (DBH).
2. PolyGum Hypropiper	40	70)	000	Sapling – Woody plants, excluding woody vines,
3				approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
4				dian's in. (7.5 cm) DBn.
5				Shrub – Woody plants, excluding woody vines,
6				approximately 3 to 20 ft (1 to 6 m) in height.
7				Herb - All herbaceous (non-woody) plants, including
8				herbaceous vines, regardless of size, and woody
9				plants, except woody vines, less than approximately 3
10				ft (1 m) in height.
11				Woody vine - All woody vines, regardless of height.
		Total Cau		
		= Total Cov		
50% of total cover:	20% of	total cover:		
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4				
5				
·-		Tatal C		Hydrophytic
		= Total Cov	er	Vegetation
50% of total cover:	20% of	total cover:		Present? Yes No
Remarks: (Include photo numbers here or on a separate s	heet.)			

-	
•	

Sampling Point: _________

Profile Desc	cription: (Describe to	the depth n	eeded to docum	nent the ir	ndicator o	or confirm	the ab	sence of	indicator	s.)		
Depth	Matrix		Redo	x Features								
(inches)	Color (moist)	%	Color (moist)	%		Loc ²	Text	ture		Remark		
4	104R 2/2								Sil	160	M	
12	54R 3/3								5:	It G	191	
	7/0								//			
1/2											1	
¹Type: C=C	oncentration, D=Deple	etion PM-Po	duced Matrix MS		Sand Gra	inc	2l ocat	tion: DI -I	Poro Linine	a M. Mote	-lu	
Hydric Soil	Indicators:	Juon, RIVIERE	duced Iviatrix, IVI	J-IVIdSKEO	Sailu Gla	III 15.	Local	tion: PL=F	rs for Pro	hlematic	Hydric So	nile ³ ·
Histosol			Dork Curfa-	(87)								JII5 :
	pipedon (A2)	-	Dark Surface Polyvalue Be		00 (50) (84	I DA 147	140\		Muck (A			
	istic (A3)	-	Polyvalue Be Thin Dark Su				146)		st Prairie I		(0)	
	en Sulfide (A4)	-	Loamy Gleye			17, 140)		•	mont Floo		ils (F19)	
	d Layers (A5)		Depleted Ma		-,				ILRA 136			
	uck (A10) (LRR N)		Redox Dark		6)						ace (TF12))
	d Below Dark Surface	(A11)	Depleted Date	k Surface	(F7)				er (Explain			
	ark Surface (A12)	_	Redox Depre									
	Nucky Mineral (S1) (LI	RR N,	Iron-Mangan		es (F12) (I	RR N,						
	A 147, 148)		MLRA 13					2				
	Gleyed Matrix (S4)	-	Umbric Surfa								vegetation	
	Redox (S5) I Matrix (S6)	-	Piedmont Flo								e present	,
	Layer (if observed):		Red Parent N	nateriai (F	21) (NILK	A 127, 147	7)	unies	s disturbe	or proble	ematic.	
Type:	Layer (ii observed).											
	shoo).		-				1 Livering	-i- C-il D-		v 1		
	ches):						Hydr	ric Soil Pr	esent?	Yes	No_	
Remarks:												
190												
												1.2
2 -												
								<u> 1941, 94</u>				

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: BiRNSborg Combines Cycle City	County: Bippsbopo Bents Sampling Date: 2/22/16
Applicant/Owner: Ember Clear, TM.	State: PA Sampling Point: 69
	tion, Township, Range: 12 RMS DOM
-1 - 1/41	elief (concave, convex, none):
Lariatoriii (Illistope, terrace, etc.).	58.52" Long: 75° 47′ 55.00" Datum: MAN 83
Soil Map Unit Name: [100 R the 47]	NWI classification: Myre
Are climatic / hydrologic conditions on the site typical for this time of year?	
Are Vegetation, Soil, or Hydrology significantly distu	
Are Vegetation, Soil, or Hydrology significantly distributed are Vegetation, Soil, or Hydrology naturally problem	matic? (If needed, explain any answers in Remarks.)
	mpling point locations, transects, important features, etc.
	inping point rocations, duriscoss, important readires, etc.
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area within a Wetland? Yes No
Hydric Soil Present? Yes No Yes No	within a Wetland? Yes No
Wetland Hydrology Present? Yes No Remarks:	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants High Water Table (A2) Hydrogen Sulfide O	
	eres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduct	
	tion in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface	
Algal Mat or Crust (B4) Other (Explain in Re	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches):	
Water Table Present? Yes No Depth (inches):	
Saturation Present? Yes No Depth (inches):	Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:
Remarks:	
7	

VEGETATION	(Five Strata)	- Use scientific	names of	plants.
-------------------	---------------	------------------	----------	---------

Sampling Point: 67
rksheet:
Species

Tires Stratum (Plot size:	,	Absolute Dominant Indicator	Dominance Test worksheet:
That Are OBL_FACW, or FAC: A	Tree Stratum (Plot size:)		
Saping Stratum (Plot size: Total Cover			
Species Across All Strate: (8) 5.			Total Number of Dominant
Freelent of Dominars Speeds.	3		
Frevelence Index worksheet: Sapling Stratum (Plot size: 20% of total cover: 50% of total cover: 20% of total cover: 32% of total cover: 400 plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (10H). 20% of total cover: 32% of total cover: 32% of total cover: 32% of total cover: 400 plants, excluding woody vines, approximately 30 ft (7 in 6 in m) in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in height and less than 3 in. (7.6 cm) or more in heig	4		Percent of Dominant Species 72 %
Total Cover			That Are OBL, FACW, or FAC:
Total Scover of:	6		Drawelence Index weedshoot
Saping Stratum (Plot size: 20% of total cover: 20% of total		= Total Cover	
ACM species	50% of total cover:	20% of total cover:	
### Stratum (Plot size:			
FACU species		20 SOS FACU-	FAC energies 20 ×2 (60)
UPL species X 5 = Column Totals Line	2. Glebits A tay Acarthy	20 yes FAC-	
Column Totals: (A) 3 0 (B) Frevalence Index = B/A = 3 8 Frevalence Index = B/A = 3 8 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is -50% 3 - Prevalence Index is 33.0° 4 - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation (Explain) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation (Explain) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation (Explain) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provide supporting data in Remarks or on a separate sheet) 1 - A - Morphytic Vegetation (Provid	3		
Prevalence Index = B/A =	4		
Total Cover	5		
Total Cover			Prevalence Index = B/A = 3,8
Shrub Stratum (Plot size:			
Shrub Stratum (Plot size:	50% of total cover:	20% of total cover:	1 - Rapid Test for Hydrophytic Vegetation
2.	Shruh Stratum (Plot size:		2 - Dominance Test is >50%
2.	1. POSA MULTIFULA	60 bes Facu	3 - Prevalence Index is ≤3.01
acta in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation (Explain)			4 - Morphological Adaptations ¹ (Provide supporting
* Total Cover			
Tracicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			Problematic Hydrophytic Vegetation' (Explain)
be present, unless disturbed or problematic. Tree	5		Indicators of hydric call and water district
Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Word – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 18 in. (7.6 cm) DBH. Word – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) DBH. Word – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 25 in. (7.6 cm) DBH. Woody – All herbaceous (non-woody) plants, excluding woody vines, approximately 20 ft (10 ft in) in height. Woody vine – All herbaceous (non-woody) plants, excluding woody vines, approximately 20 ft (10 ft in) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, less than approximately 3 ft (1 m) in height. Herb – All herbaceous (non-woody) plants, excluding woody	6		be present, unless disturbed or problematic.
Solidation Sol		= Total Cover	
approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine – All woody vines, regardless of height. Woody Vine – All woody vines, regardless of height. Hydrophytic Vegetation Present? Yes No	50% of total cover:	20% of total cover:	
1	Herb Stratum (Plot size:)		approximately 20 ft (6 m) or more in height and 3 in.
3	1		(7.6 cm) or larger in diameter at breast height (DBH).
approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub — Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Shrub — Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb — All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine — All woody vines, regardless of height. Woody Vine Stratum (Plot size:) 1 = Total Cover Woody Vine Stratum (Plot size:) 2 = Total Cover Hydrophytic Vegetation Present? Yes No	2		Sapling – Woody plants, excluding woody vines,
Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.	3		approximately 20 ft (6 m) or more in height and less
6	4		than 3 in. (7.6 cm) DBH.
7	5		Shrub – Woody plants, excluding woody vines,
8	6		
9			Herb – All herbaceous (non-woody) plants, including
10			plants, except woody vines, less than approximately 3
Total Cover			
Total Cover			Woody vine - All woody vines, regardless of height.
50% of total cover: 20% of total cover: Woody Vine Stratum (Plot size:) 1	11		
Woody Vine Stratum (Plot size:) 1			
1		20% of total cover:	
2			
3			
4			
5 = Total Cover			
= Total Cover Vegetation Present? Yes No	4		
50% of total cover: 20% of total cover: Present? Yes No	J		
50% of total cover: 20% of total cover:			
			rieseitt fes NO

~	-	
•	. 1	

Sampling Point: 69

Donth Matrix	Daday Fastures	
Depth Matrix (inches) Color (moist) %	Redox Features Color (moist)	Texture Remarks
12 7.5413/2		Sicturn
¹ Type: C=Concentration, D=Depletion, RM=Re	duced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :
Histosol (A1)	Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
Histic Epipedon (A2)	Polyvalue Below Surface (S8) (MLRA 147,	148) Coast Prairie Redox (A16)
Black Histic (A3)	Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Piedmont Floodplain Soils (F19)
Stratified Layers (A5)	Depleted Matrix (F3)	(MLRA 136, 147)
2 cm Muck (A10) (LRR N) Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	Very Shallow Dark Surface (TF12)
Thick Dark Surface (A12)	Depleted Dark Surface (F7) Redox Depressions (F8)	Other (Explain in Remarks)
Sandy Mucky Mineral (S1) (LRR N,	Iron-Manganese Masses (F12) (LRR N,	
MLRA 147, 148)	MLRA 136)	
Sandy Gleyed Matrix (S4)	Umbric Surface (F13) (MLRA 136, 122)	³ Indicators of hydrophytic vegetation and
Sandy Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA 14	
Stripped Matrix (S6)	Red Parent Material (F21) (MLRA 127, 147	
Restrictive Layer (if observed):		
Resultave Layer (il observeu).		
Type:		
		Hydric Soil Present? Yes No
Туре:	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):	-	Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No
Type: Depth (inches):		Hydric Soil Present? Yes No 🕹

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: DiROSboro Combined Cycl	City/County: Banshory Beats Sampling Date: 2/22/18
Applicant/Owner: EMMERCLEIAK, IN	State: DA Sampling Point: 99
Investigator(s):	Section, Township, Range: Branch Park
Landform (hillslope, terrace, etc.): FUN PLAN	Local relief (concave, convex, none): Slope (%):
Subregion (LRR or MLRA): Lat: [44]	
Soil Map Unit Name: Unor the 14	NWI classification: Manual NWI classification:
Are climatic / hydrologic conditions on the site typical for this	
Are Vegetation, Soil, or Hydrology si	The state of the s
Are Vegetation, Soil, or Hydrology na	70
	showing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area
Hydric Soil Present? Yes No	within a Wetland? Yes No
Wetland Hydrology Present? Yes No)
HYDROLOGY Wetland Hydrology Indicators:	Coopeday Indicators (minimum of two sequired)
Primary Indicators (minimum of one is required; check all the	Secondary Indicators (minimum of two required)
	Aquatic Plants (B14) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
	ogen Sulfide Odor (C1) Drainage Patterns (B10)
	ized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
	ence of Reduced Iron (C4) Dry-Season Water Table (C2)
	ent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin	Muck Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Othe	r (Explain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	4
	th (inches):
	th (inches):
Saturation Present? Yes No Dep (includes capillary fringe)	th (inches): Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, a	erial photos, previous inspections), if available:
Remarks:	

Absolute Dominant Indicator Species (A) 1.	VEGETATION (Five Strata) – Use scientific	names of p	plants.		Sampling Point: 99
Times Stratum (Plot size:		Absolute	Dominant	Indicator	Dominance Test worksheet:
3. Species Arross All Stratus Species Specie	1	% Cover	Species?	Status	Number of Dominant Species
## Percent of Dominant Species					
5 = Total Cover					(b)
Frevalence Index worksheet: Total % Cover of: Multiply by: OBL species					Percent of Dominant Species
Total Cover					That Are OBL, FACW, or FAC: (A/B)
Total Cover Solid in the c	<u> </u>				Prevalence Index worksheet:
Sapling Stratum (Plot size: 20% of total cover: 20% of total cover: 50% of total cover: 20% of total					
FACW species		20% of	total cover:		OBL species (4) x 1 = / (1)
FAC species X 3 = FACU species X 4 = UPL species X 4 = Column Totals: ((A) (B) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1					
### A					
5. Column Totals:					FACU species x 4 =
Column Totals: (A) (B) Prevalence Index = B/A =					
Frevalence Index = B/A =					Column Totals: (D) (A) (B)
Total Cover So% of total cover: 20% of total cover: 1. Rapid Test for Hydrophytic Vegetation 2. Dominance Test is >50% 2. Dominance Test is >50% 3. Prevalence Index is \$3.0" 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Explain) 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Explain) 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Explain) 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Explain) 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Explain) 4. Morphological Adaptations' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation' (Provide supporting data in Ramarks or on a separate sheet) Problematic Hydrophytic Vegetation Strata: Problematic Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Hydrophytic Vegetation Present? Problematic Hydrophytic Vegetation Hydrophy					
Shrub Stratum (Plot size:	6				
Shrub Stratum (Plot size:					
2. 3 - Prevalence Index is \$3.0¹ 4 - Morphological Adaptations' (Provide supporting data in Remarks or on a separate sheet) 4 - Morphological Adaptations' (Explain) 5 - 4 - Morphological Adaptations' (Explain) 6 - 4 - Morphological Adaptations' (Explain) 6 - 4 - Morphological Adaptations' (Explain) 7 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 8 - 4 - 4 - Morphological Adaptations' (Explain) 9 - 4 - Morp		20% of	total cover:		
2					
data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) Indicators of hydric soil and wetland hydrology must be persent, unless disturbed or problematic. For an an angular present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine – All woody vines, regardless of height. Woody Vine – All woody vines, regardless of height. Hydrophytic Vegetation Present? Yes No					
Problematic Hydrophytic Vegetation¹ (Explain) 1					data in Remarks or on a separate sheet)
**Job of total cover:					
Findicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Findicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Sapling - Woody plants, excluding woody vines, approximately 30 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine Stratum (Plot size:)					
Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine – All woody vines, regardless of height. ### Woody Vine Stratum (Plot size:					Indicators of hydric soil and wetland hydrology must
Some of total cover:			= Total Cove	er	
approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Total Cover 20% of total cover: Woody Vine Stratum (Plot size: 1 = Total Cover 20% of total cover: 4 Hydrophytic Vegetation Yes No No No No No No No Present? Yes No No No No_	50% of total cover:	20% of	total cover:_		
1.	Herb Stratum (Plot size:)				approximately 20 ft (6 m) or more in height and 3 in
approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. So% of total cover: Woody Vine Stratum (Plot size:) 1. 2. 3. 4. 5. — = Total Cover Hydrophytic Vegetation Present? Yes No No No	1. PhRAGmites Australis	(0)	Ses	FACE	(7.6 cm) or larger in diameter at breast height (DBH).
approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. So% of total cover: Woody Vine Stratum (Plot size:) 1. 2. 3. 4. 5. — = Total Cover Hydrophytic Vegetation Present? Yes No No No	2				Sapling – Woody plants, excluding woody vines.
Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.	3				approximately 20 ft (6 m) or more in height and less
6	4				
7					
8					
9					Herb – All herbaceous (non-woody) plants, including
10					plants, except woody vines, less than approximately 3
Total Cover					ft (1 m) in height.
= Total Cover 50% of total cover: 20% of total cover: Woody Vine Stratum (Plot size:) 1 2					Woody vine - All woody vines, regardless of height.
50% of total cover: 20% of total cover: Woody Vine Stratum (Plot size:) 1					
Woody Vine Stratum (Plot size:) 1	EO9/ of total cover-				
1		20% 01	total cover:_		
2					
3					
4 = Total Cover					
5 = Total Cover					
= Total Cover Vegetation Present? Yes No					
50% of total cover: 20% of total cover: Present? Yes No			= Total Cove	r	
	50% of total cover-				Present? Yes No
			total cover:_		

Sampling Point: 99

Profile Description: (Describe to the	e depth needed to docur	ment the indicator	or confirm the	absence of indica	ators.)
Depth Matrix	Redo	x Features			
	% Color (moist)	% Type ¹	Loc ² T	exture	Remarks
12 (OUR 3/2					ilt coun
/-					,
					4:
					
¹ Type: C=Concentration, D=Depletion	n, RM=Reduced Matrix, M	S=Masked Sand Gr	ains. ² Lo	cation: PL=Pore L	ining, M=Matrix.
Hydric Soil Indicators:				Indicators for	Problematic Hydric Soils ³ :
Histosol (A1)	Dark Surface	e (S7)			(A10) (MLRA 147)
Histic Epipedon (A2)		elow Surface (S8) (N	ILRA 147, 148		rie Redox (A16)
Black Histic (A3)		urface (S9) (MLRA			147, 148)
Hydrogen Sulfide (A4)		ed Matrix (F2)			Floodplain Soils (F19)
Stratified Layers (A5)	∠ Depleted Ma				136, 147)
2 cm Muck (A10) (LRR N)	Redox Dark	Surface (F6)			ow Dark Surface (TF12)
Depleted Below Dark Surface (A1		rk Surface (F7)		Other (Exp	olain in Remarks)
Thick Dark Surface (A12)	Redox Depre				
Sandy Mucky Mineral (S1) (LRR		ese Masses (F12) (LRR N,		
MLRA 147, 148)	MLRA 13				
Sandy Gleyed Matrix (S4)		ace (F13) (MLRA 13			f hydrophytic vegetation and
Sandy Redox (S5)		oodplain Soils (F19)			drology must be present,
Stripped Matrix (S6)	Red Parent I	Material (F21) (MLR	A 127, 147)	unless distu	rbed or problematic.
Restrictive Layer (if observed):					
Type:					/
Depth (inches):			H	ydric Soil Present	? Yes No
Remarks:					

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: BiRDS boro	orbines	cycle cityle	County: BKOSbO	ry/Bents Sai	mpling Date: 2/22
Applicant/Owner: Embour (ad, In	4.	,	A	Sampling Point: 99
nvestigator(s):	11. ()	Sect	ion, Township, Range:	Bikosbous	
Landform (hillslope, terrace, etc.):	ELUN PLA		lief (concave, convex, nor	ne): Mre	Slope (%):
Subregion (LRR or MLRA):	Lat:	1 1 11/2	38" Long: 7	5 48' 16.31	" Datum: 140 83
Soil Map Unit Name:	mathers	ts v		NWI classification	
Are climatic / hydrologic conditions on t	the site typical for	or this time of year?	Ves la No	The second secon	
Are Vegetation 4 , Soil 4 , or			/		ent? Yes No
Are Vegetation 41, Soil 4, or				explain any answers in	
, soil say, soil	Trydrology	naturally problem	iduc: (ii fiecucu, c	explain any answers in	Kelliaiks.j
SUMMARY OF FINDINGS - A	ttach site m	nap showing sar	mpling point location	ons, transects, in	portant features, etc.
		6	I		•
Hydrophytic Vegetation Present?	Yes	7 -	Is the Sampled Area		
Hydric Soil Present?	Yes	10	within a Wetland?	Yes	No_6
Wetland Hydrology Present? Remarks:	Yes	_ No			
HYDROLOGY					
Wetland Hydrology Indicators:	1:			Secondary Indicators	(minimum of two required)
Primary Indicators (minimum of one is	required; chec	k all that apply)		Surface Soil Crac	cks (B6)
Surface Water (A1)		True Aquatic Plants		Sparsely Vegetal	ted Concave Surface (B8)
High Water Table (A2)	_	Hydrogen Sulfide Or		Drainage Pattern	
Saturation (A3)	_		res on Living Roots (C3)	Moss Trim Lines	
Water Marks (B1)	_	Presence of Reduce		Dry-Season Water	
Sediment Deposits (B2)	_		on in Tilled Soils (C6)	Crayfish Burrows	
Drift Deposits (B3) Algal Mat or Crust (B4)	_	Thin Muck Surface (Other (Explain in Re	7 ·	Saturation Visible	e on Aerial Imagery (C9)
Iron Deposits (B5)	_	Other (Explain in Re	illarks)	Geomorphic Pos	and the second s
Inundation Visible on Aerial Imag	erv (B7)			Shallow Aquitard	
Water-Stained Leaves (B9)				Microtopographic	
Aquatic Fauna (B13)				FAC-Neutral Tes	
Field Observations:					
Surface Water Present? Yes _	No_()	Depth (inches):			
		Depth (inches):			
	6	Depth (inches):		lydrology Present?	Yes No 6
(includes capillary fringe)					
Describe Recorded Data (stream gau	ge, monitoring v	well, aerial photos, pr	evious inspections), if ava	illable:	
Remarks:					
Remarks.					

VEGETATION (Five Stra	ata) – Use scientific				Sampling Point:
Tree Stratum (Plot size:	1		Dominant Species?		Dominance Test worksheet:
					Number of Dominant Species
1					That Are OBL, FACW, or FAC:(A)
2					Total Number of Dominant
3					Species Across All Strata: (B)
4					Percent of Dominant Species 334
5		_			Percent of Dominant Species That Are OBL, FACW, or FAC: [A/B]
6					(705)
			= Total Cov	er	Prevalence Index worksheet:
	50% of total cover:	20% of	total cover		Total % Cover of: Multiply by:
Souling Street, m. (Diet sine		20% 0	total cover:		OBL species x 1 =
Sapling Stratum (Plot size:					FACW species x 2 =
1					FAC species x 3 = 60
2		_			FACU species 80 x 4 = 720
3		_			
4					UPL species x 5 =
5					Column Totals: (a) (A) (B)
6					Prevalence Index = B/A = 3, 8
			= Total Cov		Hydrophytic Vegetation Indicators:
	50% of total cover:	20% of	total cover:		1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size:					2 - Dominance Test is >50%
1					3 - Prevalence Index is ≤3.0¹
2					4 - Morphological Adaptations ¹ (Provide supporting
3					data in Remarks or on a separate sheet)
4					Problematic Hydrophytic Vegetation ¹ (Explain)
5					
					¹ Indicators of hydric soil and wetland hydrology must
0					be present, unless disturbed or problematic.
			= Total Cov		Definitions of Five Vegetation Strata:
	50% of total cover:	20% of	total cover:		Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:		1.0	(-00	-60	approximately 20 ft (6 m) or more in height and 3 in.
1. Festica pu		40	ye)	FREU	(7.6 cm) or larger in diameter at breast height (DBH).
	Virbiniana	40	res	FACU	Sapling – Woody plants, excluding woody vines,
3. VOUA PAPILO	ONACEA	20	bes	FAC	approximately 20 ft (6 m) or more in height and less
4			(,	than 3 in. (7.6 cm) DBH.
5					Shrub – Woody plants, excluding woody vines,
6					approximately 3 to 20 ft (1 to 6 m) in height.
7					
					Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
8			100		plants, except woody vines, less than approximately 3
9					ft (1 m) in height.
10					Woody vine – All woody vines, regardless of height.
11					woody vine - All woody vines, regardless of fleight.
			= Total Cove	er	
	50% of total cover:	20% of	total cover:		
Woody Vine Stratum (Plot siz			301011		
1					
2					
3					
4					

_ = Total Cover

20% of total cover:

50% of total cover: ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic Vegetation Present?

^	_			
•	. 1	ш	•	
_	•	"	L	_

		Sampling Point:/_
file Description: (Describe to the dep	th needed to document the indicator or confirm	the absence of indicators.)
pth Matrix	Redox Features	
ches) Color (moist) %	Color (moist) % Type ¹ Loc ²	Texture Remarks
5947		GRACEL HILL
,		
ne: C=Concentration, D=Depletion, RM	=Reduced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix.
dric Soil Indicators:	-Noddodd Madin, Mo-Madhed Sand Stalid.	Indicators for Problematic Hydric Soils ³ :
Histosol (A1)	Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
Histic Epipedon (A2)	Polyvalue Below Surface (S8) (MLRA 147,	
Black Histic (A3)	Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Piedmont Floodplain Soils (F19)
Stratified Layers (A5)	Depleted Matrix (F3)	(MLRA 136, 147)
2 cm Muck (A10) (LRR N)	Redox Dark Surface (F6)	Very Shallow Dark Surface (TF12)
Depleted Below Dark Surface (A11)	Depleted Dark Surface (F7)	Other (Explain in Remarks)
Thick Dark Surface (A12)	Redox Depressions (F8)	
Sandy Mucky Mineral (S1) (LRR N,	Iron-Manganese Masses (F12) (LRR N,	
MLRA 147, 148)	MLRA 136)	
Sandy Gleyed Matrix (S4)	Umbric Surface (F13) (MLRA 136, 122)	3Indicators of hydrophytic vegetation and
Sandy Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA 14	wetland hydrology must be present,
Stripped Matrix (S6)	Red Parent Material (F21) (MLRA 127, 147	 unless disturbed or problematic.
strictive Layer (if observed):		
Type:		
7.		Hydric Soil Present? Yes No
		nyulic soil Fleselit: Tes No
Depth (inches):		riyunc son Present: Tes No
Depth (inches):		riyunt son Fresent: Yes No
Depth (inches):		nyunc son Fresent: Tes No
Depth (inches):		nyunc son Fresent: Tes No
Depth (inches):		nyunc son Flesent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Yes No
Depth (inches):		riyunc son Fresent? Yes No
Depth (inches):		nyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No
Depth (inches):		riyanc son Fresent? Tes No
Depth (inches):		riyunc son Fresent? Tes No

APPENDIX C PHOTOGRAPHS

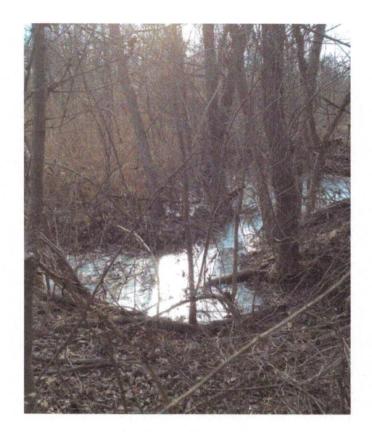


PHOTO # 1 WETLAND AREA C



PHOTO # 2 WETLAND AREA C

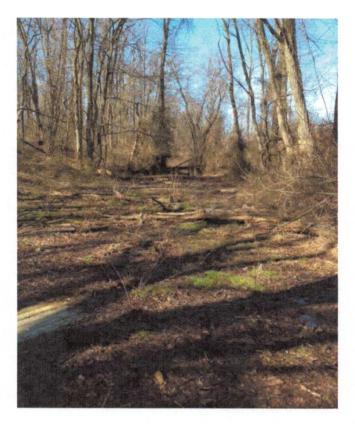


PHOTO # 3 WETLAND AREA D

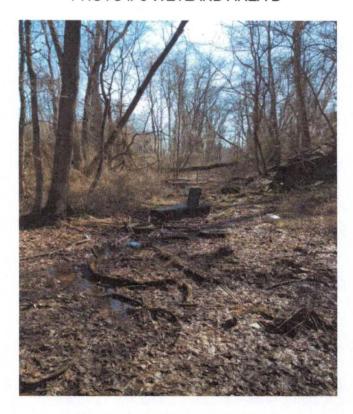


PHOTO # 4 WETLAND AREA D



PHOTO # 5 WETLAND AREA B



PHOTO # 6 WETLAND AREA B

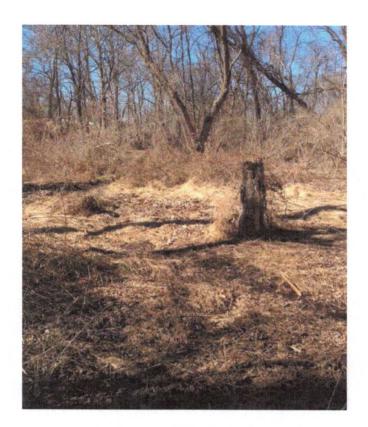


PHOTO # 7 WETLAND AREA B

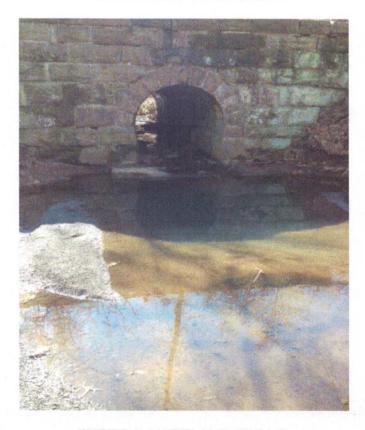


PHOTO #8 WETLAND AREA B



PHOTO # 9 WETLAND AREA B

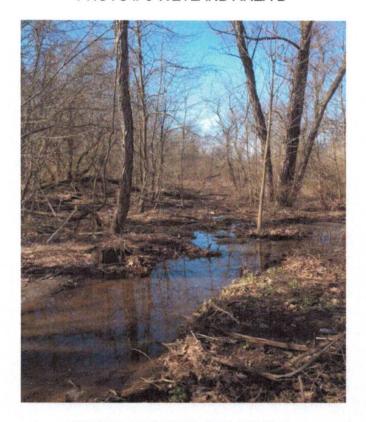


PHOTO # 10 WETLAND AREA B



PHOTO # 11 WETLAND AREA B

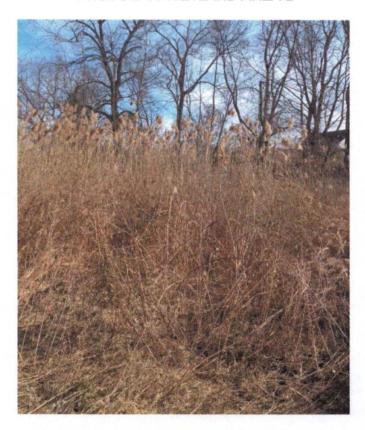


PHOTO # 12 WETLAND AREA A

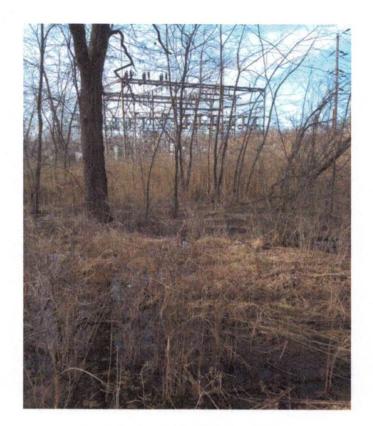
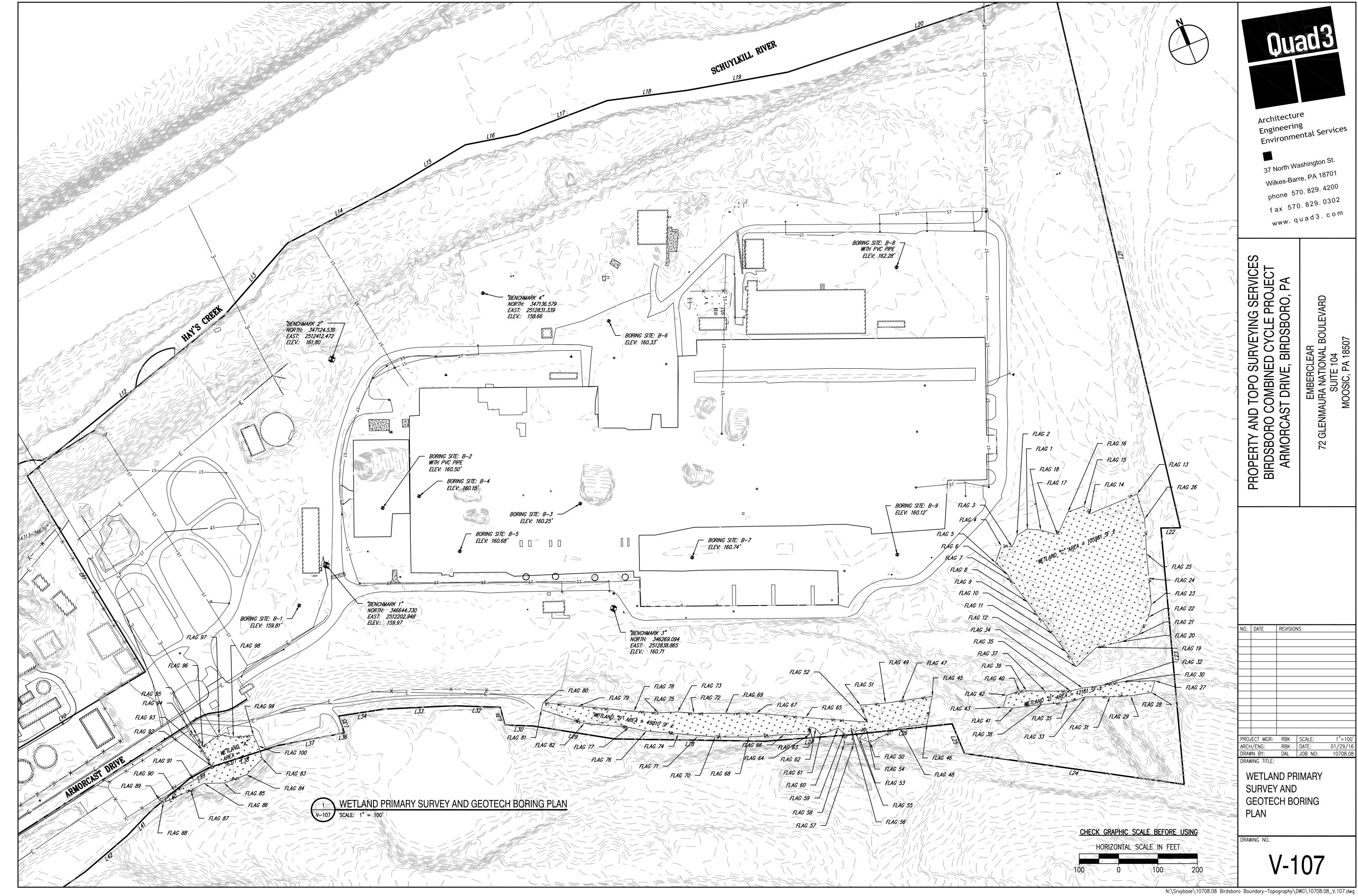


PHOTO # 13 WETLAND AREA A



Enclosure B

Please see Figure 4 in the wetland report (Enclosure A)

Enclosure C - Description of Aquatic Habitat

Aquatic Characteristics were assessed primarily through observations during field investigations conducted spring/summer 2016. During field work, 11 wetlands and 26 streams were identified within the study area (see enclosure A). An additional description of aquatic resources is presented below in accordance with ecological functions identified within the PADEP Environmental Assessment Form.

A. Aquatic Habitats Including:

(1) Food Chain Production

Food chain production within streams and wetlands is a presumably simple situation. Herbaceous and woody species make up the first trophic level while insects, birds, small and large mammals comprise the second, third, and fourth trophic levels.

(2) General Habitat – Items a through h

Habitat types encountered within the study area include: A-nesting, B-spawning, C-rearing, D-resting, E-migration, F-feeding, and G-escape cover. Fish, turtles, birds, insects, small and large mammals are the likely beneficiaries of aforementioned habitat features.

(3) Habitat for Threatened and/or Endangered Species.

The proposed project was evaluated through the use of the Pennsylvania Natural Heritage Program's Pennsylvania Conservation Explorer tool. The receipt returned potential impacts under the purview of the PA Fish and Boat Commission and US Fish and Wildlife Service.

PA Fish and Boat

Eastern redbelly turtles are known to inhabit the Schuylkill River. Coordination of proposed earth disturbance activities and permanent facilities associated with the project has occurred with the PFBC. Recommendations for avoidance and conservation of the species were provided by the agency.

US Fish and Wildlife Service

Bog turtle phase I habitat studies have been conducted for all wetlands identified within the study corridor. No bog turtle habitat was identified and a report was submitted to USFWS for concurrence. USFWS determined on November 16, 2016 and again on May 15, 2017 that the project will have no impact on bog turtles.

(4) Environmental Study Area

A review of the USGS Birdsboro, PA 7.5 Minute Quadrangle map in addition to site visitation indicated that no sanctuaries and/or refuges are located within the project area.

(5) If the project proposes stream relocation, a stream enclosure, or dredging, provide a description of the macro-invertebrate community.

Not Applicable

B. Water Quantity and Stream Flow

(1) Natural Drainage Patterns

Hydrology within the study area is eventually conveyed to the Schuylkill River via Hay Creek, Heisters Creek, and numerous other tributaries. No purposefully installed dams or impoundment structures are present in the study area; however, the railroad effectively impounds a few tributaries resulting in the formation of a wetland.

(2) Flushing Characteristics

Debris and sediment buildup do not appear to be an issue in the project area as no major impediments to flow were noted. The Schuylkill River is a wide, slow-moving watercourse that apparently possesses adequate flushing capability within the channel.

(3) Current Patterns

Tributaries delineated in the project area generally flow directly into the Schuylkill River, which flows through the study area in a southeasterly direction.

(4) Groundwater Discharge for Baseflow

Groundwater discharge likely plays a minor role establishing baseflow of tributaries in the study area. Some watercourses were noted as having baseflow at the time of field investigations during an unseasonably hot and dry summer.

(5) Natural Recharge Area for Groundwater and Surface Waters

Natural recharge and groundwater discharge is a freely exchanged when weather conditions permit. Delineated wetlands in the project area likely also serve as a point of recharge for local groundwater supplies.

(6) Storm and Floodwater Storage and Control

The Schuylkill River has some capability to control moderate frequency flood events within it's top of bank. The 100-year floodplain extends beyond the top of bank over its entire length within the project area. The 100-year floodplain corridor is largely intact and relatively undeveloped.

C. Water Quality

(1) Preventing Pollution

Pollution prevention is a key function provided by the riparian buffer associated with the Schuylkill River. Some capacity to treat stormwater for traditional non-point source (NPS) pollutants like nutrients, sediment, and select heavy metals is afforded by the wide riparian buffer. The degree of pollution prevention present in the river is largely a function of water residence time, which is assumed to be relatively long given average flow velocities in the study area.

(2) Sediment Control Patterns

Sediment is a traditional NPS pollutant. Wetlands within the study area will provide some capacity to reduce sediment loads discharged to the river. Slow moving waters of the Schuylkill provide an opportunity for sediments of larger size classes to settle out of the water into the substrate.

(3) Salinity Distribution

No analysis has been conducted concerning distribution of salinity in the river. Salt load in the watercourse will be a factor of the amount of run-off generated from surrounding roadways and parking lots.

(4) Natural Water Filtration

Natural water filtration is known to occur in areas of thick vegetation and wetlands. The stream banks and floodplain corridor are heavily vegetated with a dense understory. Wetlands are not very abundant but will contribute a positive impact with regard to natural water filtration.

D. Recreation

(1) Game Species

Terrestrial game species were observed at the time of the investigation and likely reside within the study area. Evidence of turkeys and white-tailed deer was observed throughout the project area. It is also likely that rabbits, squirrels, waterfowl, and groundhogs are prevalent in the study area. Hunting opportunity within the study area is believed to be good and likely occurs during appropriate seasons.

(2) Non-game Species

Non-game species other than birds were not identified during the time of the investigation. However, ample habitat is present within the project area to support those species that thrive in the forest, forest edge, and wetlands. Skunks, snakes, and turtles are likely present throughout the project area.

(3) Fishing

Fishing from the banks and small watercraft along the Schuylkill is assumed to be popular in the project area. Additionally, Hay Creek is seasonally stocked with trout.

(4) Hiking

Trails were observed throughout the project study area. Opportunity for public access is expected to be minimal as the study area is entirely comprised of private land.

(5) Observation

The project area is located primarily within the forested riparian corridor of the Schuylkill River and the opportunity does exist for observation. Birding should be productive as long as access to private lands is granted.

(6) Other

N/A

E. Upstream and Downstream Properties

Upstream and downstream properties are primarily comprised of woodlands. Municipal holdings are abundant in the study area along with railroads and few residences. Agricultural lands are rare and concentrated at the western terminus of the proposed line.

(1) Public Water Supplies

Public water supply (PWS) wells and surface intakes were identified within 1-mile and 2-mile radius, respectively, of any permit action associated with the proposed project. Twenty-six PWS groundwater well systems were located within a 1-mile radius of all permit actions associated with the project. One surface water intake, operated by Birdsboro Municipal Authority, is present within a 2-mile radius from multiple permit actions associated with the project.

A search for wells and intakes was initiated by referencing the guidance document, "Using eMapPA to Search for Public Water Supplies," provided by Scott Williamson, DEP Project Manager, via email on March 8, 2017. The guidance document was used to perform a search of the Pennsylvania Department of Environmental Protection's eMapPA program to identify public water supplies with respect to permitted resource crossings. This document is attached to the end of Enclosure C for reference. Coordination with a portion of the owners and/or responsible officers of groundwater wells and surface water intakes has already been performed. Prior to construction, contact will be made with the owners/responsible officers of all identified PWS groundwater wells. A summary of coordination efforts is documented in the public water supply (PWS) Coordination Status Table located in Enclosure D, B(5)a.

An analysis on the potential for the project to impact PWS wells was discussed in Enclosure D, B(5)a.

(2) Private Water Supplies

Private water supplies are present along the project corridor. Using publicly available information, properties within 450' of project permit actions were examined for their potential to utilize private water supplies.

eMapPA's Public Water Supply Service Area layer was utilized to determine which properties along the project corridor are likely serviced by a public water supply. Any properties located within 450' of a project permit action and not located within eMapPA's Public Water Supply Service Area were considered likely to rely on private water supplies. Coordination with Robeson Township revealed there is no municipal water available to residents so all residential parcels within 450' of a permit action within Robeson Township are assumed to be on private well water. A list of properties potentially containing private water supplies is included in Enclosure D, B(5)a, Table 3.

Addtionally, DCNR's PAGWIS database was searched for springs located in Birdsboro Borough and Union, Exeter, and Robeson Township. None of the listed springs were located within 450' of the project limit of disturbance. A review of the PAGWIS database for groundwater wells for each municipality revealed that a few of the properties contained within Enclosure D, B(5)a, Table 3 have documented private groundwater wells.

F. Other Environmental Factors determined by Site Investigation.

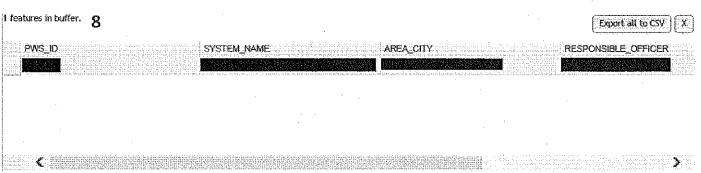
The Schuylkill River has a TMDL in place for PCBs. Fish are believed to be impacted and eating fish caught from the river is not recommended.

Using eMapPA to Search for Public Water Supplies

Access eMapPA: http://www.depgis.state.pa.us/emappa/

Below are instructions for using the buffer tool to buffer a point to search for public water supplies. For public water supplies, the feature layers are listed as "Groundwater Wells" and "Surface Water Intakes." For security reasons, the location of public water supply features will not be displayed on the public map; however, the contact information for the responsible official for the public water supply within the buffered area will be displayed. Typically the default Zone II Well Head Protection Area is a 0.5-mile radius. A 2-mile radius is recommended for surface water intakes.

1. Find the location of interest by zooming into the map using the mouse scroll wheel or the zoom in/out tools in Layers Legend 2 Tasks Links Zoom in/out tools Buffer a Layer 2. In the left panel select the "Tasks" tab. 3 - Buffer Sensitive Layer (Data Only) Select the "Buffer Sensitive Layer (Data Only)" Buffer a option. 4 point Polyline Polygon 4. Select the "Point" radio button. Enter buffer distance Miles 5. Enter desired buffer distance in miles (must be ≥ 0.5 miles). Layer to buffer 6. In the "Layer to buffer" dropdown menu, select 6 Select layer "Groundwater Wells" or "Surface Water Intakes." 7 Create Buffer Clear 7. Click Create Buffer then click a point on the map to crate the buffer. ▶ Extract Data 8. The buffered area will be shaded red on the map and a window will appear at the bottom of the map containing information for any public water supplies ▶ Locate in the buffered area. Information includes: PWS ID, System Name, City, Responsible Officer, and a Measurement contact phone number. If additional information is required (e.g. is a project ▶ Print located upstream or downstream of surface water intake?) please contact the responsible official to discuss specifics.



Enclosure D - Project Impacts

A. Discuss Impacts on:

(1) National, State or Local Park, Forest or Recreation Area

In the Project area, the Schuvlkill River is designated as a modified recreational waterway under the Pennsylvania Scenic Rivers Act. In a letter dated October 16, 2017 from the PA DCNR Scenic River program, the agency determined that cumulative impacts from the project on the Schuylkill Scenic River are limited to visual impacts to the scenic nature of the river. PA DCNR requested mitigation actions to be integrated into the project to further protect river values. The mitigation actions include: complete the portion of the project within the scenic river corridor in late fall or early spring when recreation use of the river is minimal, post appropriate safety signage on the Schuylkill River to notify waterway users that they are entering a construction area once construction is underway, minimize the ROW width in riparian zones as much as possible by crossing the river at a perpendicular angle, hand clearing as little vegetation as possible, and incorporate native vegetation in any disturbed areas to maintain the natural character and scenic qualities of the waterway. All mitigation measures will be incorporated to the extent practicable. Please refer to Requirement U of the application package for a complete record of correspondence concerning the PA Scenic Rivers Act.

The river has also been designated as a water trail by the PA Fish and Boat Commission. No construction will occur within the river and the proposed project will not impact water based recreation activities, fish, or other aquatic life. Approximately 10 acres of riparian forest will be cleared and maintained to allow operation of the electric transmission line. A contiguous forested buffer will remain between the Schuylkill River and the edge of the ROW over the entirety of the line except for the river crossings. The remaining riparian buffer will be a minimum of 90' wide and exceeds 200' at numerous locations.

(9) Areas Identified as Prime farmland

Overall, the project area contains approximately 27.4 acres of prime farmland soils. The ring bus station construction is the only proposed activity that will directly impact prime farmland. The facility will occupy approximately 2.25 acres of prime farmland soils, of which approximately 1.6 acres are actively farmed. Therefore, approximately 6% of the total prime farmland soils within the proposed project limit of disturbance will be converted to a non-agricultural use. Please refer to the Site Plan located in Requirement H. for a representation of prime farmland mapped soils in relation to project facilities.

Alternative siting of the facility was considered and determined infeasible for a variety of reasons. Adjacent parcels were not available for purchase or easement. Other suitable tie-in locations would require adding at least 0.7 miles to the route, which would result in additional surficial disturbance. Adjacent locations evaluated where a tie-in was potentially feasible are either located within the regulatory floodway or are residential parcels near housing. Based on these constraints, the proposed location was considered the best practicable option.

B. Discuss the Environmental Impacts on:

(1) Aquatic Habitats Including:

Food Chain Production

Food chain production within the site is not expected to be altered as a result of the proposed project. Trophic levels and species involved will persist unaffected.

b. General Habitat – Items (1) through (8)

There are no anticipated significant impacts to nesting, rearing, resting, feeding, and escape cover habitat throughout the project area where clearing of the right-of-way occurs. Species currently using the project study area are expected to remain abundant with no measurable decline.

c. Habitat for Threatened and/or Endangered Species.

No significant impacts to threatened and endangered species are anticipated as a result of the proposed project. Project clearance letters have been ascertained from the PA Fish and Boat Commission and US Fish and Wildlife Service concerning the project.

d. Environmental Study Area

No sanctuaries and/or refugees are located within the project area.

(2) Water Quantity and Stream Flow

The ROW was reduced to widths of 50' to 60' within the boundary of the Schuylkill River floodway to minimize permanent floodway impacts, while providing the necessary area needed to complete construction activities and perform maintenance activities in the future. These impacts will not increase the flood risk in the vicinity of the project nor degrade water quality. Once construction activities are complete within the ROW, small trees and shrubs may be permitted to re-establish the area.

No significant impacts to water quantity and streamflow characteristics (a-f) are anticipated.

(3) Water Quality

No significant impacts to water quality (a-d) are anticipated. Riparian buffers will be left intact over the majority of the project area and hand clearing of trees will be required in and around tributaries to protect the low understory species and herbaceous layer. Mechanized clearing and grubbing will not be permitted within 50 feet of any stream top of bank. The proposed project will not degrade local or regional water quality. Stormwater outfall discharges at the power plant will be within established water quality limits. Waste water produced at the site will go to

the Birdsboro Treatment plant prior to discharge into Waters of the Commonwealth. A discussion of the project's consistency with the State antidegradation requirements (25 Pa. Code §105.14(b)(11) is provided below.

(4) Recreation

a. Game Species

Permanent impacts leading to a reduction in usage of the project area by game species are not anticipated. Deer and turkey thrive along utility rights of way.

b. Non-game Species

Permanent impacts leading to a reduction in usage of the project area by non-game species are not anticipated. Species using the area are likely already adapted to the forest edge since the project area is developed beyond the Schuylkill corridor. The area within and adjacent to the project already contains multiple other utility lines and other development, and therefore is already fragmented.

c. Fishing

No degradation to fishing is anticipated as a result of the proposed project since in-stream activities are not proposed. Access to bank side fishing spots will not be inhibited by permanent project related facilities. Additionally, there will be no impedances introduced into the watercourse that would limit angling activities from small watercraft.

d. Hiking

Existing trails may become clearer and compacted as inspection vehicles traverse the ROW periodically over the life of the line.

e. Observation

The opportunity for observation of wildlife may be increased through clearing of the right-of-way. Common game animals will be easier to spot along these areas where visibility has been increased.

f. Other

N/A

(5) Upstream and Downstream Properties

Impacts to upstream and downstream properties will be limited to the viewshed and are considered de minimus. The right-of-way and electric line will be visible to some limited stakeholders. The existing viewshed in the area is already comprised of existing overhead electric lines and a railroad.

a. Water Wells

No impacts to public and private water supply wells are anticipated as a result of construction activities associated with the project. The following activities have

the limited potential to affect water wells within 450 feet of electric line construction.

Trenching for the installation of Duct Bank: Electric line encased in concrete duct bank will be trenched approximately five feet below the ground's surface at select locations. Because this activity is within the soil horizon, it is not expected to impact groundwater resources. This activity is also limited in areal extent and bedrock is not expected to be encountered.

Manholes: There are a total of three manholes that are proposed to be constructed with the Transmission Line. The manholes will be constructed to allow access to the transmission line splice joints, repairs, and other work. These will be located along the underground portion of the Transmission Line. Manholes will extend below the trench depth by up to four feet and are not expected to encounter bedrock or the water table. These activities are extremely localized and not expected to impact groundwater quality.

Electric Utility Poles: A total of 31 electric transmission monopoles will be placed along the above ground alignment and connect to the combined cycle power generation facility. The poles will be drilled approximately 25 to 45 feet below ground surface. The installation of these poles is likely to encounter groundwater and may cause a short-term increase in turbidity in the immediate vicinity of the borings.

The subject area is located within the Piedmont Physiographic Province of Pennsylvania that is part of a large sedimentary basin. The underlying bedrock is composed of sedimentary rocks of the Triassic Age. No areas of exposed bedrock are reported from the subject area with its entirety overlain by soils.

The Brunswick Formation is mapped as underlying the transmission corridor. This formation consists predominantly of fine grained reddish-brown shale, mudstone, and siltstone that is interbedded with sandstone. The primary porosity and permeability of the formation is low. Groundwater primarily occurs within secondary porosity caused by joints and bedding planes. The groundwater in the corridor is expected to flow toward the Schuylkill River. Industrial pumping wells impact the flow direction locally. The small withdrawal rates associated with residential wells are not expected to have a significant impact on groundwater flow direction.

A total of seven wells are listed on the Pennsylvania Ground Water Information System (PAGWIS) as identified within 450 feet of the transmission line. Based on coordination with Robeson Township, municipal water is not available, so it is assumed that all Robeson residents rely on private water wells. PAGWIS listed residential private wells located along the transmission line corridor vary in depth from less than 30 feet to more than 200 feet with an average soil depth of 25 feet. Proposed construction activities within the soil zone are not expected to impact groundwater wells due to the low permeability cohesive soils that are mapped in the area. Thirty-four total parcels were identified within 450 feet of a proposed permit action associated with the project. Only wells within 450 feet of a monopole installation location and not separated from the work area by the Schuylkill River were considered for evaluation of potential impacts.

Residential wells in the region are reported to be between 97 and 300 feet deep with reported well yields up to 30 gpm.

The Arkema facility, located north of the Schuylkill River has large capacity industrial wells, which are expected to influence groundwater flow direction. These wells are located in the Arkema industrial facility and are between 312 and 353 feet deep with reported yields in excess of 201 gallons per minute (gpm).

Most construction activities are not expected to encounter groundwater. However, drilling up to 45 feet during caisson installation will be completed for the monopoles. These activities may encounter groundwater and may cause short term increases in turbidity in close proximity to the activities. Only extremely localized turbidity impacts, if any, are anticipated due to the low porosity of the Brunswick formation. Although, no impact to public and private water supply wells are anticipated as a result of construction activities, the Applicant suggests that the potable well owners be notified when drilling activities are occurring so owners can report any increased turbidity noted during this period.

Coordination with responsible officers/owners of public water supply wells and surface intakes has been conducted (Table 1 below). Tables 2 and 3 respectively provide a listing of additional public water supplies and potential private well owners located within 450 feet of a proposed permit action associated with the project. The Applicant will coordinate with these public water supplies prior to initiation of construction activities within DEP jurisdictional areas. The eight private parcel owners located within 450 feet of a monopole installation and not buffered from potential impacts by the Schuylkill River are denoted as planned for coordination in Table 3.

Table 1. PWS Coordination Status Table

PWS_ID	SYSTEM_NAME	AREA_CITY	RESPONSIBLE_OFFICIER	Phone #		Coordination Sent (Date Sent - Method of Delivery)	Final Response Date	
Groundwater Wells within 1.0-mile								
3060461	ST JOHNS UNITED CH OF CHRIST	ROBESON TWP		(610)582-8508	50239	Yes (3/21/2017 hardcopy)	n/a	
3060477	SOUTHEND GUN CLUB INC	EXETER TWP	JOEL FRANCO, HEAD TRUSTEE	(610)582-4289	50246	Yes (3/21/2017 hardcopy)	n/a	
3061211	ROBESON TOWNSHIP CONCESSION	ROBESON TWP	COLEEN EASTERDAY, MANAGER	(610)582-4636	50645	Yes (3/16/2017 email)	3/17/2017	
3060899	GIBRALTAR PLAYGROUND	ROBESON TWP	ROBESON TOWNSHIP			163 (5) 10) 2017 emaily	3/ 1// 2017	
3060536	FORK AND ALE	UNION TWP	GARY FRY	(610)953-3213	50282	Yes (3/20/2017 email)	3/22/2017	
3060061	KEYSTONE EAST MHP	EXETER TWP	MIKE BOISSON	(610)582-8738	50002	Yes (3/21/2017 hardcopy)	4/13/2017	
3061056	ISLAND PIZZA	AMITY TWP	WILLIAM VANNEMAN	(610)404-7800	50522	Yes (3/13/2017 - email and 3/14/2017 hardcopy)	n/a	
3061158	AYDIN DISPLAYS INC	AMITY TWP	ART MENGEL	(610)404-7400	50600	Yes (3/21/2017 hardcopy, 4/5/2017 and 4/11/2017 emails)	n/a	
3061221	UNION MEADOWS PARK		MICHEAL MONTONDO, AUTH CHAIR	(610)385-3769	50650	Yes (3/13/2017 email)	3/15/2017	
Surface W	ater Intakes within 2.0-mil	es						
3060010	BIRDSBORO MUNI WATER AUTH	BIRDSBORO BORO	AARON J. DURSO, MANAGER	(610)582-6030	2693	Yes (4/21/2017)	4/24/2017	

Table 2. Additional PWS Groundwater Wells

PWS_ID	SYSTEM_NAME	AREA_CITY	RESPONSIBLE_OFFICIER	PHONE	ID
3060649	ALLURA CORP	EXETER TWP	JODY WENRICH	(610)582-8761	96478
3060570	ANGUS PUB	EXETER TWP		(610)582-5132	96463
3060678	ARKEMA INC	EXETER TWP	WILLIAM SMITH	(610)582-1551	Multiple
3060091	AVW INC	EXETER TWP	DONALD PEIFER, PRESIDENT	(610)582-2410	Multiple
3060611	BERKS POULTRY	EXETER TWP	CARL MILLWARD	(610)582-2726	Multiple
3060468	BLUE COAT INN			(610)582-1033	96453
3060009	EDDIE SMITH TRAILER TERRACE	EXETER TWP	EDDIE SMITH	(610)582-3940	Multiple
3060463	EXETER BIBLE CH	EXETER TWP	DAVE KLINE OR JIM SMITH	(610)582-4191	82503
3060897	HAHN CONSTRUCTION			(610)582-8785	96528
3061121	HILLCREST HALL	ROBESON TWP	NICHOLAS PHILLIPS	(610)582-5672	82904
3061214	PAGODA MOTORCYCLE CLUB	EXETER TWP	PETE RADER, TRUSTEE	(484)529-1870	83010
3060855	SENSIENT TECHNICAL COLORS	ROBESON TWP	JIM AMMEND	(610)582-8765	82709
3061031	SOUTHERN ROCK CAFE	EXETER TWP	RICH MOYER	(610)404-1965	96564
3060853	SUNNY SPOT GRILL		FAE I. ZELONIS	(610)582-3687	96506
3060480	SUNSET FAMILY RESTAURANT	EXETER TWP	WARDEH HOUIR	(610)582-1574	82512
3060929	VALLEY FORGE FLAG CO.	EXGTGR TOWNSHIP	MS MARY O'BOYLE PLANT MANAGER	(610)582-4239	96542
3060911	VFW POST 411	ROSESON TWP	ATTN COMMANDER	(610)582-4848	96534

Note: No additional PWS surface water intakes were identified within 2 miles of a permit action.

Table 3. Potential Private Groundwater Wells within 450' of Project Permit Actions

PROPID	OWNER NAME	PARCEL LOCATION ADDRESS	MUNI	MAILING ADDRESS	MAILING CITY	MAILING STATE	MAILING ZIP	Coordination Planned
43533406398756	EXETER TWP AUTH	400 HANOVER ST	EXETER	R D 3 FAIRLANE & DEMOSS ROADS	READING	PA	19606	Yes
43533518206080	FICK SCOTT F & STACEY E	211 DENNIS DR	EXETER	211 DENNIS DR	READING	PA	19606	Yes
43534405189169	M B INVESTMENTS	S CENTER RD	EXETER	2650 AUDUBON RD	AUDUBON	PA	19403	Yes
73532402982466	PLOW LAND AND TREE LLC	100 OLD RIVER RD	ROBESON	4339 MORGANTOWN RD	MOHNTON	PA	19540	Yes
73532402990678	WU CHIALIN	164 OLD RIVER RD	ROBESON	164 OLD RIVER RD	BIRDSBORO	PA	19508	No
73532402899791	BRUNK MATTHEW T & CRYSTAL L	174 OLD RIVER RD	ROBESON	174 OLD RIVER RD	BIRDSBORO	PA	19508	No
73532402991479	PIENTA MICHAEL	15 ROBESONON LAWN RD	ROBESON	68 BITTING RD	ALBURTIS	PA	18011	No
73532402991674	CONRAD BRIAN ASHLEY	OLD RIVER RD	ROBESON	1750 COTTON ST	READING	PA	19606	No
73532402992314	YOCOM DUSTIN A & KRAMMES MELISSA S	35 ROBESONON LAWN RD	ROBESON	35 ROBESONON LAWN RD	BIRDSBORO	PA	19508	No
73532402992652	SCHULER GLENN A & PAMELA A	154 OLD RIVER RD	ROBESON	154 OLD RIVER RD	BIRDSBORO	PA	19508	No
73532402993520	MILLARD DONALD S JR	OLD RIVER RD	ROBESON	115 GREEN RD	FORT HILL	PA	15540	No
73532402994407	MILLARD DONALD S JR	138 OLD RIVER RD	ROBESON	115 GREEN RD	FORT HILL	PA	15540	No
73532519711776	READINGER MICHAEL L	53 BOONETOWN RD	ROBESON	53 BOONETOWN RD	BIRDSBORO	PA	19508	No
73533405094037	KOHL STEPHEN E & HEATHER M	46 OLD RIVER RD	ROBESON	46 OLD RIVER RD	BIRDSBORO	PA	19508	Yes
73533405184989	SCHURR JENNIFER A	1921 MAIN ST	ROBESON	1921 MAIN ST	BIRDSBORO	PA	19508	Yes
73533405189905	CHERNESKY JOHN R	979 SCHUYLKILL RD	ROBESON	PO BOX 521 980 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405190541	RAPAK PAUL E	1045 SCHUYLKILL RD	ROBESON	1045 SCHUYLKILL RD	BIRDSBORO	PA	19508	Yes
73533405191430	MORGANDALE MICHAEL S & LINDA C	1031 SCHUYLKILL RD	ROBESON	1031 SCHUYLKILL RD	BIRDSBORO	PA	19508	Yes
73533405197117	NANNEN PHILIP J & LAURA H	989 SCHUYLKILL RD	ROBESON	989 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405199186	CHERNESKY JOHN R	980 SCHUYLKILL RD	ROBESON	PO BOX 521 980 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405280925	CASCIANO BARRY M & FAITH L	968A SCHUYLKILL RD	ROBESON	968 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405280992	CASCIANO BARRY M & FAITH L	968 SCHUYLKILL RD	ROBESON	968 SCHUYLKILL RD	BIRDSBORO	PA	19508	No

Table 3. Potential Private Groundwater Wells within 450' of Project Permit Actions (continued)

PROPID	OWNER NAME	PARCEL LOCATION ADDRESS	MUNI	MAILING ADDRESS	MAILING CITY	MAILING STATE	MAILING ZIP	Coordination Planned
73533405282809	CASCIANO BARRY M & FAITH L	952 SCHUYLKILL RD	ROBESON	968 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405283813	ASPLEN RALPH W	938 SCHUYLKILL RD	ROBESON	222 VERNON RD	MORRISVILLE	PA	19067	No
73533405283853	YOHN MICHAEL A	944 SCHUYLKILL RD	ROBESON	944 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533405284788	AMENU MILLION	934 SCHUYLKILL RD	ROBESON	934 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533406286717	MAMMARELLA STEPHEN C & MARCIE L	920 SCHUYLKILL RD	ROBESON	920 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533406288667	WEINHOLD RODNEY LEE/MARJORIE E	890 SCHUYLKILL RD	ROBESON	890 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533406381745	GINIEWSKI STANLEY J JR & JUDITH E	876 SCHUYLKILL RD	ROBESON	876 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533406382508	SHANER JAMES D & PATRICIA L	866 SCHUYLKILL RD	ROBESON	866 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533406386449	MOTTA CARL B	OLD RIVER RD	ROBESON	181 TROXEL RD	BIRDSBORO	PA	19508	No
73533406481865	KEEHN DENNIS L & SUSAN M	800 SCHUYLKILL RD	ROBESON	800 SCHUYLKILL RD	BIRDSBORO	PA	19508	No
73533407679896	GRAND INVESTMENT CORP	OLD RIVER RD	ROBESON	PO BOX 264	BIRDSBORO	PA	19508	No
73533407683313	ROBESON ASSOCIATES INC	OLD RIVER RD	ROBESON	PO BOX 264	BIRDSBORO	PA	19508	No

b. Surface Water Intakes

The nearest surface water intakes serve Birdsboro, Union Township and Pottstown. The Birdsboro/Union intake is located approximately 2 miles away and upstream of project activities. According to Mr. Durso, no impacts to the Birdsboro Municipal Authority public water supply are anticipated as a result of the project. Pottstown owns and operates a surface water intake located approximately 6 miles downstream of project activities along the Schuylkill River. No impacts to this public water supply are expected due to the distance downstream, lack of in-stream work in the Schuylkill, and de minimus nature of the proposed work.

(6) Other Environmental Factors determined by Site Investigation.

The Armorcast site is currently undergoing remedial actions to render on-site soils and groundwater compliant with the non-residential Statewide Health Standard. Based on the investigations conducted to date, construction activities proposed on the parcel formerly occupied by Armorcast, are not anticipated to result in the spread of contamination to the aquifer or Schuylkill River. All work within this parcel will be governed by a Construction Monitoring and Waste Management Plan submitted that is included in this application package (see Requirement H). This plan will ensure on-site contaminants, if encountered, are not mobilized and transported into the aquifer or nearby Schuylkill River, as a result of the project.

C. Identify all environmental impacts on other adjacent land and water resources associated with the construction, modification or operation of the dam, reservoir, water obstruction, or encroachment in the area of the project.

No significant environmental impacts to adjacent land and water resources are anticipated as a result of the project.

D. Identify and evaluate the potential cumulative environmental impacts of this project and other potential or existing projects like it, and the impacts that may result through numerous piecemeal changes to the resource.

Cumulative impacts are calculated by taking into consideration the construction of the proposed electric generation facility, electric transmission line, natural gas pipeline, and waterline as one unit. Consideration is also given for projects in the past, present, and foreseeable future. Potential impacts to resources located within the limit of disturbance of these projects was considered in the early stages of project planning to determine the location which created the least overall impact.

As discussed in the alternatives analysis (Requirement S), limitations including environmental impacts, property availability, engineering constraints due to existing utilities, and exorbitant expense for alternate routes all contributed to the final determination of utility line placement. Methodologies were employed for all aspects of the project to provide the least impact to resources. Examples of these methodologies include placing the electric transmission line by helicopter to eliminate stream encroachment during construction and the use of horizontal

directional drilling (HDD) and conventional bores for installation of the natural gas pipeline and water line at select resource locations. These construction methods eliminate surface impact and render ecological function of wetland and stream resources unaltered. Consideration of permanent impacts was given the most weight for cumulative impact analysis; however, temporary, direct, indirect, and secondary impacts were considered during feasibility studies conducted early in project planning.

EXISTING AND FUTURE LAND USE

Overall, the cumulative analysis indicates that the project will not result in significant adverse impacts to the area due to the already disturbed and fragmented landscape. Existing conditions in the project area reflect changes from past and present activities. Land use within the vicinity of the power plant and electric transmission line footprint includes: commercial development, railroad right-of-way, existing transmission line right-of-way, residential development, roadways, and the Schuylkill River. Commercial warehouses, the Exeter Township Sewer Plant, Arkema, Inc., Birdsboro Wastewater Treatment Plan, and other facilities of a similar footprint are present. Throughout the proposed natural gas pipeline right-of-way, parcels are cleared for agricultural production, transportation corridors, and limited residential development. Pipeline installation is considered a complementary land use to agriculture since the land is protected from surface development and farmers can continue to use the land for crop production as they did prior to pipeline installation. The waterline alignment closely follows an existing transportation corridor. Project related alterations of the natural environment will have minimal impact to current and future regional development. Operators for the cumulative project footprint, Birdsboro Power, LLC, the Reading Area Water Authority, and DTE Appalachia Midstream, LLC, do not anticipate installation of ancillary facilities in the future to support the needs of the current project proposal. The power plant, gas line, water line, and electric line represent a complete buildout of the infrastructure required to accomplish project goals.

Other permitted projects in the vicinity include the Pagoda Motorcycle club; a permit (E06-652) was issued for the relocation of their existing club onto a previously vacant parcel. The project proposal permanently impacts 638 linear feet and 6,201 sq. ft. of watercourse along with 0.07 acre of permanent wetland fill. These permanent impacts were offset through the creation of a 0.27 acre constructed wetland near the center of the site. This parcel is routed with approximately 990 linear feet of the proposed natural gas pipeline and houses the Schuylkill River HDD exit pit. Wetland MB4 will sustain a temporary impact of 0.06 acre for the open trench placement of the natural gas pipeline. This resource was previously impacted by the Pagoda Motorcycle Club (PMC) but the area impacted by the pipeline was left untouched. PMC offset those impacts as stated above and the wetland creation site will not be disturbed by the pipeline project. Due to the temporary nature of the wetland impacts associated with the pipeline, it is believed that cumulative permanent impacts to wetland MB4 will not differ significantly upon completion of the pipeline project once the area of the crossing has been restored.

The Armorcast site is currently undergoing remedial actions to render on-site soils and groundwater compliant with the non-residential Statewide Health Standard. Based on the investigations conducted to date, construction activities proposed on the parcel formerly occupied by Armorcast, are not anticipated to

result in the spread of contamination to the aquifer or Schuylkill River. All work within this parcel will be governed by a Construction Monitoring and Waste Management Plan submitted with each application package. These plans will ensure on-site contaminants, if encountered, are not mobilized and transported into the aquifer or nearby Schuylkill River, as a result of the project. Additionally, DTE's pipeline installation activities will adhere to their Preparedness, Prevention, and Contingency (PPC) Plan and Control and Disposal Plan.

Please refer to the excerpt from Resource Report 1 (GAI Consultants, 2017) for additional discussion concerning past, present, and potential future projects in the region.

WATERS OF THE COMMONWEALTH

Cumulative impacts to waters of the Commonwealth will be minimized through proper implementation of avoidance, design, and mitigation measures. Adverse impacts, as a result of the proposed project, were evaluated in the earliest stages of project development to minimize or avoid encroachments to environmental resources. Total resource impacts proposed for all project activities are summarized in Table 1 in the project description under Requirement J of the application.

Adverse impacts to aquatic resources will be avoided. The electric transmission line poles were sited to avoid excavation impacts to wetlands and streams. Additionally, mechanized clearing and grubbing of the ROW is prohibited within the regulatory floodway of most watercourses. For the natural gas line and the water line, impacts to most sensitive aquatic resources (exceptional value wetlands, trout streams, and wetlands supporting T&E populations) are avoided through the use of trenchless technologies. Horizonal Directional Drilling (HDD) and conventional boring are technologies that allow for placement of the proposed natural gas pipeline and water line without disturbance to stream bed and banks and wetlands from construction equipment. To minimize the possible risk of inadvertent return (IR) associated with trenchless crossing, detailed investigations of subsurface conditions were conducted and used to design each HDD crossing in a manner that reduces the risk of an IR. An IR contingency plan has been prepared for the project that will minimize potential impacts to water resources and facilitate clean-up in the event an IR occurs. Careful design of each HDD and preparation of an IR contingency plan represent the best practicable impact avoidance and minimization efforts for trenchless resource crossings. Thus, water quality will be maintained throughout the project right-ofway at resource crossing locations where trenchless technologies are employed.

In areas where open trench installation of utility lines is proposed, measures will be implemented to ensure streambed materials are segregated and replaced to match pre-construction conditions at each crossing location. Permanent impacts are not anticipated within the top of bank of any watercourse crossed by the proposed project. No loss of stream channel is anticipated.

Adherence to approved project design plans will ensure there is no detectable impact to regional water quality. Successful implementation of erosion and sediment controls as approved by BCCD and DEP will be utilized to remove the risk of water quality impairment during project construction activities.

Riparian Impacts

Adverse impacts to riparian areas will be avoided by minimizing tree removal in floodways. In the case of the electric line, no mechanized clearing, grubbing, or equipment entry will be permitted within most regulatory floodways. The only proposed work at these locations will entail the cutting and removal of trees by hand. Stumps will be allowed to remain and re-sprout to enhance post construction stabilization of stream banks. Once construction of the line is complete, small trees and shrubs will be permitted to re-establish within the ROW. Vegetative maintenance of the ROW will be conducted via mechanical means and herbicide usage is not anticipated. Only a very small percentage of the Schuylkill River riparian forest will be converted from mature second growth to a successional state.

The cumulative project impact will not increase local or regional flood risk or degrade water quality measurably on a regional or resource basis. Individual stream segments may experience extremely localized de minimus water quality impacts during construction. These segments may be affected by clearing and grading of stream banks, in-stream trenching, trench dewatering, and back filling. Temporary minor modification to the benthic environment and riparian areas, and increased sedimentation and turbidity could be experienced. These impacts are minimized and avoided to the extent practicable through adherence to the approved project E&S plans.

Proposed ROWs were co-located with existing utility and transportation ROWs where possible to reduce the total number of new riparian encroachments. Temporary work spaces within riparian zones are not proposed as construction will take place within the permanent ROW at those locations. Permanent ROWs were reduced to minimum widths required for construction in riparian zones. Riparian buffer areas will be revegetated following construction in accordance with applicable E&S Plans.

Coordination Under the PA Scenic Rivers Act

Coordination with DCNR's Rivers Program Specialist under the PA Scenic Rivers Act indicates cumulative impacts are limited to visual impacts to the scenic nature of the river. Suggested mitigation measures were incorporated to the extent practicable. Most of the electric line ROW running parallel to the river will not be readily visible from the river since it will be buffered from view by at least 90' of mature forest that will remain in-tact between the river's edge and cleared ROW. An Aids to Navigation (ATON) Plan has been prepared and approved to ensure safe passage of watercraft during HDD activities associated with gas line installation. No significant in-stream impacts to the Schuylkill River are anticipated since construction of the electric line will not require access to the Schuylkill River and the pipeline crossing is proposed as an HDD. The only instream work proposed for the Schuylkill as part of the cumulative project will be the installation of the HDD telemetry wire used to guide the drill head. Please refer to Requirement U of the application package for a complete record of correspondence concerning the PA Scenic Rivers Act.

Groundwater

Public and private water supplies within proximity to permit actions have been documented in each respective application to ensure procedures are in place during construction to adequately protect potable water sources and their users. Please refer to Water Wells discussion above.

WETLAND IMPACTS

Field surveys were conducted within the footprint of proposed facilities to identify proposed alignments that, among other factors, avoided or minimized wetland impacts. The current proposed alignments minimize wetland impacts while maintaining engineering standards and safety. Similarly, as discussed above, a combination of trenchless technology and ROW width reductions were employed to minimize and avoid impacts to wetlands.

Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment.

Temporary impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a wetland that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment.

Based on these definitions, construction of the electric line, gas line, and water line will result in 2.49 and 0.01 acres of cumulative permanent and temporary wetland impact respectively. The project will result in no net loss of wetlands, although there will be some permanent conversion and potential minor impacts to functions and values, which are discussed in more detail below

Permanent Wetland Conversion

Permanent wetland impacts are limited primarily to the conversion of palustrine forested (PFO) wetlands to palustrine scrub-shrub (PSS) and palustrine emergent (PEM) wetlands due to vegetative maintenance requirements associated with the ROW. No conversion impacts are proposed in EV wetlands. Small portions of two PSS wetlands will also be converted to PEM systems. Impacts to functions and value as a result of conversion are discussed in the "Wetland Functions and Values" section below. The table below lists all permanent conversion impacts associated with the proposed project. A total of 1.09 acres of PFO and PSS wetland will be converted to 0.8 acre of PSS and 0.29 acre of PEM.

Wetland Name	Project	Permanently Impacted Wetland Classification	Impacted Delineated Wetland Wetland EV Wetland Wetland Area (ft²) Status		EV Status	Converted Wetland Classification	Converted Wetland Area (ft²)	
							PSS	PEM
ARK4	Electric Line	PFO	0.13	871	No	PEM/PSS	871	0.0
CH7	Pipeline	PFO	0.09	745	No	PEM/PSS	452	293
CO2	Pipeline	PFO	0.37	802	No	PEM/PSS	753	49
KL1	Pipeline	PSS/PFO	10.64	15,076	No	PEM/PSS	11,276	3,800
LP2	Pipeline	PFO	6.18	22,777	No	PEM/PSS	16,929	5,848

Wetland Name	Project	Permanently Impacted Wetland Classification	Total Delineated Wetland Acreage	Wetland Impact Area (ft²)	EV Status	Converted Wetland Classification	Conv Wetlan (ft	d Area
MB12	Pipeline	PSS	0.19	1,815	No	PEM/PSS	1,271	544
MB33	Pipeline	PFO	5.59	5,025	No	PEM/PSS	3014	2011
MU7	Pipeline	PSS	0.02	435	No	PEM/PSS	282	153
						TOTAL	34,848	12,698

Exceptional Value (EV) Wetland Impacts

No permanent impacts to EV wetlands or loss of functions and values of EV wetlands are anticipated among the projects collectively. EV wetlands were avoided during utility line routing and through use of trenchless technologies. The open trench crossing of GF2 on the gas line project is the only EV resource that will have minor temporary impacts. Due to geologic conditions near the crossing, an open trench crossing is more environmentally protective than the originally proposed HDD crossing. The wetland will be restored to preconstruction conditions in accordance with the approved E&S plan and wetland restoration detail.

Wetland Functions and Values

Delineated wetlands were subjected to a functions and values assessment. Methodologies employed for this assessment were developed by the Regulatory Branch of the New England District of the USACE. This "Descriptive Approach" is widely applicable for any project where characterization of wetlands is necessary to secure a Section 404 permit regardless of geographic locale. A Wetland Function-Value Evaluation Form was prepared for each delineated wetland to document observed characteristics prior to construction. A discussion of potential impacts to functions and values commonly documented within the project area is provided below.

 Groundwater Recharge/Discharge - Subsurface placement of utility lines may impact groundwater discharge and recharge rates in wetlands. Proper placement of trench plugs in accordance with approved E&S plans will maintain these functions during and after construction.

Conversion of a PFO system to PEM may cause the groundwater table to rise, as is common after forest clearing. The amount of conversion occurring in systems where this principal function occurs is anticipated to result in an insignificant change within those wetlands, as both PFO systems will experience less than 5% of their PFO cover being converted to PEM.

Overall, cumulative impacts to groundwater recharge/discharge as a function will be limited to the temporary impairment during construction activities associated with each project, but no permanent impacts are anticipated.

 Floodflow Alteration - Grading activities in wetlands may temporarily impact floodflow alteration capacities. Impacts to this function will be temporary and returned to pre-construction condition once the affected area has been restored to pre-construction grades and stabilized in accordance with approved E&S plans. Increased floodflow velocities may also be experienced until re-vegetated areas are permitted to mature into a thick ground cover. Conversion of PFO to PSS/PEM systems are unlikely to significantly impact the ability of the wetland to store flood waters, because contours will be restored to pre-construction condition. Overall, impacts to this function are anticipated to be temporary and limited to the construction period associated with each project. No permanent impacts are anticipated.

Fish and Shellfish Habitat - No wetlands within the project area were observed to act as habitat to fish or shellfish, but instead were observed to provide indirect ecosystem services to fish and shellfish populations. These functions mainly include providing shaded streamside habitat, bank stabilization for abutting watercourses, and exporting food resources that sustain multiple trophic levels within the abutting watercourse. Impacts to streambank stabilization and production export are discussed below. Cumulative impacts to this function/value are anticipated to be insignificant as only a small portion of the riparian wetland area along streams will be impacted. Where conversion of PFO to PSS/PEM occurs, shaded habitat, previously provided by trees, will be reduced and water temperatures in these localized areas may rise. However, this conversion is not anticipated to impact the temperature of the watercourse overall, and sufficient shaded habitat will still be present for organisms to utilize. Therefore, the Project is not anticipated to have an adverse permanent impact this function for wetlands on it crosses.

The watercourses that abut these wetlands, and in which the fish inhabit, will not be permanently impacted. Stream bed substrate will be segregated and stockpiled to be replaced in accordance with preconstruction contours and size distribution, allowing fish spawning habitat to be maintained and not impacted beyond construction. Dry crossing methods for watercourse crossings will minimize downstream mobilization of sediment and limit impacts to aquatic life. Construction will avoid seasonal in-stream construction restrictions to protect trout. Stream crossings will be trenched and backfilled in the same day further minimizing the temporary impact of stream crossings on aquatic life.

• Sediment/Toxicant Retention and Nutrient Removal – Removal of vegetation will temporarily impact these wetland functions. These functions are expected to be unchanged as a result of the proposed project once vegetation is allowed to re-establish. PFO conversion impacts will not appreciably diminish a wetland's ability to provide these ecosystem services. Conversion of PFO wetlands to PEM wetlands may increase species richness in the complex and allow a broader collective ability for nutrient uptake. Overall, these functions will be temporarily impacted during construction due to the loss of vegetation & disturbed soils; however, no permanent impacts are anticipated after restoration of pre-existing contours and revegetation occurs.

- Production Export Temporary impacts to the amount of available food resources during construction activities may occur. Permanent impacts are unlikely as food sources (i.e. vegetation) will regrow once construction activities are completed. Where conversion of PFO to PSS/PEM occurs, food resources may become more diverse and improve the food resources available to organisms that inhabit and forage within wetlands. Cumulative impacts are anticipated to be temporary as soils and vegetation are disturbed during construction activities. No permanent impacts to this function are not anticipated.
- Sediment/Shoreline Stabilization Clearing of wetland vegetation within the riparian zone of adjacent watercourses may cause decreased streambank stabilization during construction activities. Construction ROWs were reduced to the minimum widths necessary for installation of each line. Stream bed and banks will be restored to a stabilized condition so that this function in wetlands directly abutting streams is not permanently impacted. Cumulative impacts to this function are expected to be temporary and limited to the construction period of each project. Revegetation of riparian areas per the E&S Plan will ensure no permanent impacts to this function occur. No conversion impacts are proposed to wetlands performing this function.
- Wildlife Habitat Temporary, short-term impacts may be unavoidable to non-mobile species in localized directly impacted areas of wetlands. The wetland will be restored upon completion of construction and use of the area is expected to be restored to pre-construction condition. More mobile species are expected to occupy adjacent undisturbed habitats during construction. Additionally, where conversion of PFO to PSS/PEM habitat occurs, forested habitat will be permanently lost; however, because only a small portion of the PFO wetlands impacted will be converted, organisms should be able to find suitable habitat nearby for nesting, spawning, rearing, and resting. The replacement of PFO habitat with PSS/PEM habitat may increase habitat diversity for local species. This may increase food resource diversity for the local ecosystem and may be beneficial for organisms that utilize this habitat.
- Educational/Scientific Value and Uniqueness/Heritage Wetlands within the natural gas line project area were observed to be suitable for these functions. Only two of these, Wetlands KL1 and LP2 were determined to possess the "uniqueness/heritage" function as a primarily function/value. Both of these wetlands contain a diversity of wetland classes and surface water resources. This function will not be degraded in either of these wetlands as the proposed project will introduce further class diversity to the wetland complexes. A few wetlands, delineated within the natural gas pipeline's project area, were determined to possess T&E populations or maintain the habitat required for those T&E species. These wetlands could be used as a reference site to establish familiarity of diagnostic characteristics of the species. No impacts are anticipated to these wetlands, since impacts will be avoided through trenchless technology. One wetland is located adjacent to an archeological site;

however, the archeological site was avoided during project design and this value will not be impacted. . These functions were considered suitable, although not primary functions, for Wetlands MB24, MB25, and MB33 along the natural gas pipeline. These wetlands are large PFO systems where little to no disturbance is proposed. Wetland MB24 will not be impacted by construction and impacts to Wetland MB25 will be avoided by utilizing trenchless technology for the crossing. Wetland MB33 will be crossed via typical trenching. The impact will result in the conversion of less than 2% of the delineated wetland being converted from PFO to PEM/PSS wetland. The impact will not disturb core PFO habitat, will not be visible from primary viewing locations, and the impact totals are minimal; therefore, it is not anticipated that the natural gas pipeline project will have a permanent impact on this wetland. Cumulative impacts to wetlands where these functions/values were considered suitable are considered insignificant and no permanent impacts are anticipated.

 Endangered Species Habitat – All rare, threatened, and endangered species habitats are avoided through the use of trenchless technologies. Capacity of delineated wetlands in the project area as habitat for threatened and endangered species will not be altered. Therefore, cumulative temporary or permanent impacts to this function are not anticipated.

Overall, the cumulative project will result in no net loss of wetlands. There will be minimal permanent conversion of vegetation cover type in wetlands. No net measurable change of individual or collective wetland functions or values is expected to result from cumulative project developments.

Mitigation Measures

Cumulative impacts to waters of the Commonwealth will be minimized through proper implementation of avoidance, design, and mitigation measures. Adverse impacts, as a result of the proposed project, were evaluated in the earliest stages of project development to minimize or avoid encroachments to environmental resources. Where construction ROWs for the electric line, water line and natural gas line cross water resources, they have been limited to the width necessary, in order to ensure proper and safe installation of each line. Adherence to E&S Controls, seasonal construction restrictions, and other measures, as discussed elsewhere, will ensure any impacts associated with construction of the projects are mostly temporary and insignificant.

The only permanent wetland impacts from the electric and natural gas lines result from conversion of PFO and PSS wetlands to PEM wetlands. Impacts associated with conversion have been discussed elsewhere. For the electric transmission line, the conversion of Wetland ARK4 was minimized by reducing the construction right-of-way and choosing the best possible alignment. Permanent wetland conversion impacts will be offset via a permittee-responsible mitigation (PRM) plan, which proposes to reforest 2.23 acres of exceptional value (EV-PEM) wetlands within the riparian corridor of Bieber Creek. An additional 1.55 acres of supporting upland riparian habitat will also be reforested under the plan. The complete PRM plan is available in Requirement T under the cover of the E06-717 permit application package.

HDDs will be utilized at four locations along the natural gas pipeline ROW to eliminate surficial disturbance to particularly large or sensitive resources. Clearing or occupation of the surficial ROW by construction equipment in areas utilizing HDD as a resource avoidance measure will not be permitted.

Conventional bores will be used to avoid EV wetland AC1 on the natural gas pipeline project and EV Wetland 3 and Hay Creek on the water line project.

DTE intends to implement FERC's Wetland and Waterbody Construction and Mitigation Procedures (May 2013) as a minimum standard during construction of the natural gas pipeline. Procedures listed in FERC's resources will be implemented to minimize effects on wetlands from project activities during the construction, post-construction restoration, and operation phases of the project. Approved Chapter 102 and 105 permits will be followed, where they are more stringent than the FERC.

THREATENED AND ENDANGERED SPECIES IMPACTS

Cumulative impacts to threatened and endangered species, were analyzed. Each project component completed and maintained a Pennsylvania Conservation Explorer receipt that depicts proposed routing.

Coordination with state and federal agencies has occurred for all aspects of the project. A determination of no impact or no adverse impact was returned by all agencies for all species provided conservation and avoidance measures are adhered to. Detailed information concerning coordination with all jurisdictional agencies with purview over T&E species is included in the project description and Requirements F and G of each application.

A list of species evaluated during the T&E review process for the proposed project includes:

- Bog Turtle (Clemmys muhlenbergii)
- Indiana Bat (Myotis sodalis)
- Northern Long-Eared Bat (Myotis septentrionalis)
- Eastern redbelly turtle (*Pseudemys rubriventris*)
- Migratory Birds
- Bald Eagle (*Haliaeetus leucocephalus*)
- Golden Eagle (Aquila chrysaetos)
- Northeastern Bulrush (Scirpus ancistrochaetus)
- Eastern Spadefoot (Scaphiopus holbrookii)
- Cattail Sedge (Carex typhina)
- Showy Goldenrod (Solidago speciosa var speciosa)

Historic and Archaeological Resources

Section 106 consultation with the PA SHPO, Tribes, and other identified consulting parties has been undertaken for the above ground and below ground cultural resources for each of the proposed project components. The SHPO has concurred that there is no adverse effect to cultural resources for the electric transmission line, water line, and power plant projects.

Potential effects to archaeological sites identified for the natural gas pipeline project have been avoided through design changes. The PHMC concurred that no further archaeological investigations are necessary for this project in a letter dated 9/19/2017. The Determination of Effects Report for above ground resources is currently under review with the PHMC and a finding of Historic Property Adversely Affected is anticipated as a result of visual effects to the NRHP Listed Oley Township Historic District. FERC will consult with the PHMC and other consulting parties to develop appropriate measures to mitigate the adverse effect on the historic district; therefore, no cumulative impact to Section 106 resources is anticipated for the project.

ANTIDEGRADATION CONSISTENCY

The basic concept of antidegradation is to promote the maintenance and protection of existing water quality for High Quality (HQ) and Exceptional Value (EV) waters, and protection of existing uses for all surface waters. The following sections are intended to demonstrate cumulative proposed project activities are consistent with Pennsylvania's antidegradation policy.

Special Protection Watersheds

A very small portion of the proposed project is sited in a special protection watershed. Bieber Creek (EV) is in vicinity of the proposed natural gas pipeline Tetco tie-in location at the northern terminus of the project. The limit of disturbance (LOD) in this watershed accounts for approximately 2.5% of the total LOD. No water obstruction or encroachments are proposed in Bieber Creek or any of its tributaries as a part of the project. Furthermore, no tree clearing is permitted within the watershed and the project's LOD is more than 250' away from Bieber Creek or its tributaries. Bioretention/infiltration facilities will be constructed to eliminate the net change in stormwater runoff rate, volume, and quality. Antidegradation best available combination of technologies (ABACT) practices proposed for this area include a 100' long rock construction entrance (RCE) and compost filter socks.

Exceptional Value (EV) Wetland Crossings

The proposed cumulative project crosses seven EV wetlands. The natural gas pipeline crosses six and RAWA's water line crosses one. No EV wetlands are delineated along the electric transmission line right-of-way (ROW). All EV wetland crossings are proposed as trenchless crossings except the GF2 crossing on the natural gas pipeline. The GF2 crossing is proposed as an open trench due to geologic conditions at this location. The permanent ROW and proposed LOD across GF2 were minimized to the extent practicable. No trees will be cleared and contours and hydrologic patterns will be returned to pre-construction conditions. ABACTs proposed near these crossings may include 100' RCEs (where applicable) and compost filter socks. Employment of ABACTs, minimization of surficial disturbance, and avoidance of these critical resources though HDD technology will ensure identified EV wetlands are protected.

Other Wetland and Watercourse Crossings

Typical permanent ROW and LODs were consistently minimized for every resource crossing associated with the proposed project. Requirement S (Alternatives Analysis) of the natural gas pipeline application discusses resource specific avoidance measures. HDD avoidance of palustrine forested (PFO) wetlands was also investigated as part of the alternatives analysis. HDD is not practical for the gas line wetland crossings at KL1, MB33, and LP2. Workspaces

were reduced to minimum practicable widths to ensure existing water quality use designations are preserved. LODs in riparian buffers were also minimized and will only be maintained as herbaceous cover only where necessary for the natural gas pipeline. In the case of the electric transmission line, vegetation will be allowed to regrow in riparian buffer areas in accordance with the vegetative maintenance plan. Riparian buffer loss is not expected to significantly impact water quality characteristics or cause any degradation of existing stream uses.

Point Source Discharges

No point source discharges are proposed in special protection waters (EV or HQ). Three existing stormwater outfalls (Schuylkill River) are proposed for repair as part of the application. These outfalls will be repaired to handle stormwater generated at the combined cycle powerplant. The following sections describe measures to be taken at the powerplant to ensure that stormwater effluent is as clean as possible and no degradation to existing use water quality occurs.

A. Good Housekeeping

Good housekeeping practices will be implemented throughout the site. Floors will be swept when needed. Wastes, including litter, wastewater, debris, or other materials, will be contained and covered within enclosed buildings or in the designated trash and recycling disposal locations. Wastes will be disposed of offsite as required in accordance with state and federal regulation and permits. Any spill or leaks of any chemical substances will be cleaned up and disposed of immediately with spill kit supplies staged throughout the Facility. Street sweeping of paved areas will occur in the event that excess sediment accumulates on the paved access road or parking areas due to winter sanding or other unforeseen reasons. The Oil/Water Separators will be inspected to check the level of water within the separator and measure the depth of bottom sludge and floating oils. No open or closed drums will be stored outdoors or uncovered.

B. Vehicle and Equipment Washing

No vehicle washing will occur at the site. Equipment washing, if necessary, will not enter any storm drainage system or surface waters.

C. Floor Drains

Floor drains within the Power Block are routed to an Oil/Water Separator, which separates and detains any oil, prior to being discharged to the municipal sewer system. Best Management Practices will be used to minimize the number of solids and oil that flow into the Oil/Water Separator. Facility personnel will be instructed to avoid spills and address small spills using sorbents to minimize runoff of oil into the Oil/Water Separator.

D. Roof Areas

Roof areas are newly constructed and clean. They are unlikely to accumulate or contribute pollutants to stormwater.

E. Spill Prevention Procedures

Spill prevention procedures include engineering controls, materials management procedures designed to minimize the potential for spills to occur during material handling, security measures and operation and maintenance procedures. In general, industrial materials and commodity products/chemicals are kept inside

buildings, which are locked when not in operation or the materials are contained in secure tanks on the secured property. All sensitive areas of the Facility are surrounded by chain link fencing. Tank truck loading/unloading procedures are conducted under the supervision of Facility personnel to ensure that proper procedures are followed.

Threatened and Endangered Species

HDD technologies are proposed as avoidance measures to ensure threatened and endangered species potentially inhabiting surface waters within the project are not impacted. Agency consultation has resulted in letters of no adverse effect for the project. Detailed information concerning threatened and endangered species in the project area is available under Requirements F and J of the joint permit application.

Antidegradation Best Available Combination of Technologies (ABACT)

The following is a list of common ABACTs to be employed throughout the project area during construction.

- Compost filter socks
- 100' Rock construction entrances
- Erosion control blankets
- Horizontal Directional Drilling
- Bored waterbody crossings

Consistency Determination

Based on the above project information, it is anticipated that the project will not have a significant impact to special protection watersheds or existing use water quality designations in vicinity of the project.

E. Identify and describe all other dams, water obstructions or encroachments which may or will be needed, in addition to those described in this application, to fulfill the purpose of the current project.

Additional water obstruction and encroachments are required for the natural gas pipeline and water line that will service the power plant. Utility line crossings of watercourses and wetlands associated with these lines will be permitted under a separate cover. A tabulation of anticipated impacts resulting from these crossings is provided in the project description section of the application package. Cumulative resource impacts associated with all aspects of the project are discussed generally in the previous section of this document. Please refer to each individual application for proposed resource specific water obstruction and encroachment details.

will be built in a manner that ensures public safety. At the state level, the PA Department of Labor and Industry sets regulations for the construction and operation of tanks containing flammable and combustible liquids. The PA Department of Environmental Protection (PaDEP) sets regulations to protect against air pollution and air emissions. Also, the PaDEP coordinates with the U.S. Environmental Protection Agency which has established regulations regarding pollution prevention and emergency planning and response. There are also Federal safety standards that the facility will be built to inclusive of, but not limited to, 29 OSHA 1910 General Industry Standards, Federal Aviation Administration regulation and National Fire Protection Association requirements.

Birdsboro Power, LLC is obtaining permits/approvals for construction and operation of their facility. A table listing anticipated permits and latest status is included in Appendix 1-H. The United States Fish and Wildlife Service (USFWS) responded on May 11, 2015, that the facility is not likely to adversely affect the federally-listed bog turtle (*Glyptemys muhlenbergii*). An updated clearance from the USFWS including the Long-eared bat (*Myotis septentrionalis*) listing was received on October 6, 2015 and is included in Appendix 1-I. An application was submitted to the DRBC for Approval of Water Use on May 19, 2016 and approval was issued on December 14, 2016. The PA SHPO provided clearance on November 25, 2015.

1.9 Cumulative Impacts

Cumulative impacts associated with the Project would result from the combined effect of construction and operation of the Project facilities with other construction projects in the vicinity of the Project. To evaluate the potential cumulative impacts, DTE considered 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," per 40 CFR § 1508.7.

This analysis generally follows the methodology set forth in relevant guidance [Council on Environmental Quality, 1997; United States Environmental Protection Agency (EPA), 1999]. Under these guidelines, inclusion of other projects within the analysis is based on identifying commonalities of impacts from past, present, and potential projects to potential impacts that would result from the proposed Project. For an action to be included in the cumulative impact analysis, it must:

- impact a resource area potentially affected by the Project;
- cause this impact within the proposed Project area; or
- cause this impact within the resource-specific geographic boundary of where the Project will also have an impact; and
- cause this impact within the time span for the potential impact from the proposed Project.

Actions in the Project vicinity were evaluated for significance if they would generally occur within the same town, county, and/or watershed as the Project. Distant projects were eliminated from further evaluation because their impacts would not likely overlap with the Project's area of impact. The timing of selected projects, as the potential for cumulative effects is dependent on the duration of the impact. Present projects were considered to overlap with the Project in time of occurrence. Focus was placed on the resources identified in this Environmental Report, including groundwater, waterbodies, and wetlands; vegetation and wildlife; cultural resources; socioeconomics; geology and soils; land use, recreation, special interest areas, and visual resources; and air quality and noise. Regions of influence for analysis are described in more detail in Table 1.9-1.



Table 1.9-1
Region of Influence for Cumulative Impact Analysis

Environmental Resource	Area of Impact
Soils and Geology	Construction workspaces
Groundwater, Wetlands, Vegetation, Wildlife	Hydrologic Unit Code (HUC) 12 Watershed
Surface Water Resources	HUC 12 Watershed. For direct in-water work (e.g. dredging) include potential overlapping impacts from sedimentation, turbidity, and water quality
Cultural Resources	Overlapping impacts within the Area of Potential Effects
Land Use	One-mile wide corridor centered over the pipeline
Visual	0.25-mile and existing visual access points (e.g., road crossings)
Noise - Operations	Not applicable - No significant aboveground facilities are proposed, therefore no cumulative impacts for noise - operations are anticipated
Noise - Construction	0.25-mile from pipeline. 0.5-mile from HDD or direct pipe installation
Air Quality - Construction	0.25-mile from pipeline or aboveground facilities
Socioeconomics	Not applicable - No significant aboveground facilities are proposed, therefore no cumulative impacts for socioeconomics are anticipated
Environmental Justice	Not applicable - No significant aboveground facilities are proposed, therefore no cumulative impacts for environmental justice are anticipated

1.9.1 Scoping

DTE reviewed publically available sources for information on past, present, or potential projects, and contacted county and township planning entities (telephone memos included in Resource Report 8, Appendix 8-A). As mentioned in Section 1.1.1, the Birdsboro Facility is the primary purpose and need of the Project. The pipeline will be dedicated to the Birdsboro Facility and will provide 100 percent of the natural gas required to operate the Birdsboro Facility. The Birdsboro Facility is being included as a reasonably foreseeable project and is incorporated in the cumulative affect analysis for the Project since it is being constructed and operated by others as a separate project.

Projects considered in the cumulative analysis are presented in Table 1.9-2 and described below. A map showing the projects considered in the cumulative impacts analysis is included as Figure 1.9-1.

1.9.1.1 Federal and State

The Commission's eLibrary was used to research proposed natural gas and other Commission-regulated energy projects filed in Berks County, PA. There is one Commission-regulated project (Mariner II East Pipeline) located within Berks County, however it is located approximately seven miles southwest and is not within the Project's regions of influence.

The USACE Public Notices bulletin was reviewed for the Baltimore District. No projects were identified within the Project's regions of influence (USACE, 2016).

The PaDEP Pipeline Portal was also reviewed for recent news releases within the Project's regions of influence. No Projects were identified within the Project's regions of influence (PaDEP, 2016).



Table 1.9-2
Past, Present, and Reasonably Foreseeable Projects Identified within the Region of Influence

Project Name and Sponsor/ Proponent	Location (City/County) and Approximate Distance and Direction from the Project	Project Type	Description	Footprint/Layout and Anticipated Impacts	Permits/ Authorizations Required and Description of Environmental Review Required (if any)	Current Status and Schedule	Applicable Region of Influence
Energy Projects							
Birdsboro Power Plant Project Birdsboro Power, LLC	Birdsboro, Berks County, PA. Project is located directly abutting the Pipeline ROW.	Electric Power Generation	Birdsboro Power is constructing a 485 MW, natural gas-fired power plant in the Borough of Birdsboro. The facility is designed to generate electricity using a combustion turbine generator and a heat recovery steam generator that will provide steam to drive a steam turbine generator.	Footprint: 99-acre parcel. This parcel is an existing disturbed industrial site. Anticipated Impacts: impacts to the 99-acre area are expected to be minimal due to the site being an abandoned commercial site which has been previously disturbed.	 PaDEP Air Permit BCCD-NPDES Borough of Birdsboro - Land Use Permit USFWS PFBC FAA DRBC SHPO PGC PADCNR 	Work Begin: 2017 (estimate) Completion Date: Anticipated inservice April 2019	Soils and Geology - overlapping construction workspace. Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030611 crossed by the proposed Project. Surface Water Resources - within HUC 12 watershed 020402030611. Noise Construction - within 0.25-mile of Pipeline ROW.
PennDOT Road an	d Bridge Improvement Project	S				I	
Mill Race Bridge (PennDOT)	Mill Race Bridge on State Route 2047 over Monocacy Creek. Amity Township, Berks County, PA. Located 1.8 miles east of Pipeline ROW.	Bridge Replacement	This project involves the replacement/rehabilitation of the Mill Race Bridge on State Route 2047 over Monocacy Creek.	Footprint: Project footprint is estimated to be approximately 0.4-mile in length and encompass 0.17-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Work Begin: 9/25/2017 Completion Date: Not Specified	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030610 crossed by the proposed Project.
Blacksmith Road Bridge (PennDOT)	Blacksmith Road over Manatawny Creek in Amity Township, Berks County, PA. Located 2.7 miles southeast of Pipeline ROW.	Bridge Replacement	This project involves the replacement or rehabilitation of the bridge carrying Blacksmith Road over Manatawny Creek.	Footprint: Project footprint is estimated to be approximately 0.5-mile in length and encompass 0.18-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: 1/1/2018 Completion Date: Not Specified	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030503 crossed by the proposed Project.
SR 562 Monocacy Creek (PennDOT)	SR 0562 over Monocacy Creek. Exeter Township, Berks County, PA. Located 1.29 miles west of Pipeline ROW.	Bridge Replacement/ Rehabilitation	This project involves a bridge replacement/rehabilitation on SR 0562 over Monocacy Creek.	Footprint: Project footprint is estimated to be approximately 0.3-mile in length and encompass 0.11-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: 6/10/2019 Completion Date: Not Specified	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030503 crossed by the proposed Project.
2041 Box Culvert Replacement (PennDOT)	SR 2041 (Weavertown Road) over tributary to Monocacy Creek. Amity Township, Berks County, PA. Located 0.25 miles east of Pipeline ROW.	Road Construction	This project involves the replacement of a box culvert on State Route 2041 (Weavertown Road) over the tributary to Monocacy Creek.	Footprint: Project footprint is estimated to be approximately 0.3-mile in length and encompass 0.10-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: 8/15/2016 Completion Date: 8/9/2017	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030610 crossed by the proposed Project. Noise Construction - within 0.25-mile of Pipeline ROW.



Table 1.9-2 (Continued)

Project Name and Sponsor/ Proponent	Location (City/County) and Approximate Distance and Direction from the Project	Project Type	Description	Footprint/Layout and Anticipated Impacts	Permits/ Authorizations Required and Description of Environmental Review Required (if any)	Current Status and Schedule	Applicable Region of Influence			
PennDOT Road and	PennDOT Road and Bridge Improvement Projects (continued)									
T-575 Fisher Mill Road Bridge Project (PennDOT)	Fisher Mill Road (T-575) over the Manatawny Creek. Oley Township, Berks County, PA. Located 0.53- mile east of Pipeline ROW.	Bridge Replacement/ Rehabilitation	This project involves the replacement/rehabilitation of a bridge carrying Fisher Mill Road (T575) over the Manatawny Creek in Oley Township including roadway approaches, guiderail, drainage and other miscellaneous construction.	Footprint: Project footprint is estimated to be approximately 0.4-mile in length and encompass 0.17-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: 3/26/2018 Completion Date: 11/26/2018	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030503 crossed by the proposed Project.			
SR 1026 Bridge Project (PennDOT)	SR 1026 over Pine Creek. Pike Township, Berks County, PA. Located 1.20 miles east of Pipeline ROW.	Bridge Replacement/ Rehabilitation	This project involves a bridge replacement/rehabilitation on SR 1026 over Pine Creek.	Footprint: Project footprint is estimated to be approximately 0.2-mile in length and encompass 0.10-acre (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: Not Specified Completion Date: Not Specified	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030501 crossed by the proposed Project.			
SR 73/662 Corridor Safety (PennDOT)	SR 73 and 662. Oley Township, Berks County, PA. Located 0.28-mile west of Pipeline ROW.	Road Construction	This project involves construction of a roundabout at both intersections of State Route 73 and 662 in Oley Township, Berks County.	Footprint: Project footprint is estimated to be approximately 0.84-mile in length and encompass four acres (estimate).	Statewide Transportation Improvement Program. Environmental assessment not available.	Begin Work: 8/6/2018 Completion Date: 11/29/2019	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030503 crossed by the proposed Project. Noise Construction - within 0.25-mile of Pipeline ROW.			
Commercial and Ind	Commercial and Industrial									
River Run Meadows Apartments (Housing Development Corporation Mid- Atlantic)	190 Spring Grove Court in Robeson Township, Berks County, PA. Located four miles west of pipeline ROW.	Residential Development	Housing Development Corp. Mid- Atlantic will build River Run Meadows Apartments, a 58-unit complex covering roughly 52 acres on a wooded plot between Reading and Birdsboro off Route 724.	Footprint: 52-acre wooded site off Route 724 in Berks County.	This information is not publicly available.	Begin Work: Construction is expected in early 2017 Completion Date: Spring 2008	Groundwater, Wetlands, Vegetation, Wildlife and Surface Water Resources - within HUC 12 watershed 020402030606 crossed by the proposed Project.			



Major highway or bridge projects currently planned within the Project area were reviewed using the PennDOT Transportation Improvement Program site, which shows highway and bridge projects on PA's Four and Twelve Year Transportation Program and Regional Transportation Improvement Plans. The Project crosses roads with planned infrastructure improvements, such as construction of a roundabout and replacement of a box culvert (PennDOT, 2016a). Five bridge replacement/rehabilitation projects under PA's Rapid Bridge Replacement Program were identified in Berks County starting in September 2017 through November 2019, however these are not located within the Projects regions of influence (PennDOT, 2016b).

1.9.1.2 Local Reviews

DTE contacted the county and local municipalities for information regarding planned developments within the Project area. One planned residential development was identified by representatives at the Robeson Township Office. The planned project is known as The River Run Meadows Apartments and is within the Project's regions of influence and is located approximately four miles west of the Project (Pedersen, 2016).

1.9.2 Potential Cumulative Impacts of the Proposed Action

1.9.2.1 Groundwater, Wetlands, Vegetation and Wildlife

Cumulative effects on groundwater resources are expected to be limited to areas that are affected by other projects located near the Project. Potential impacts would be avoided or minimized by the use of both standard and specialized construction techniques, including those specified in DTE's Spill Prevention, Control and Containment Plan.

The projects listed in Table 1.9-2 are all located within HUC watersheds crossed by the Project. Impacts to wetlands and waterbodies associated with the proposed Project are expected to be temporary in nature. DTE will obtain the permits required by the Clean Water Act Section 404, which seeks to avoid and minimize individual and cumulative impacts to federally-regulated wetlands and would be required for all development projects impacting wetlands and waterbodies. Should development projects result in the unavoidable loss of wetlands or steams, the USACE and PaDEP have comprehensive mitigation processes to offset and prevent net loss to resources. Therefore, DTE does not anticipate significant cumulative impacts to wetlands and waterbodies as a result of the proposed Project and/or other development projects in the Project area.

When projects are constructed in the same general location and timeframe, they could have a cumulative impact on local vegetation and wildlife communities. ROW clearing and grading and other construction activities associated with the Project would result in the removal of vegetation; alteration of wildlife habitat; displacement of wildlife; and other potential secondary effects such as increased population stress, predation, and the establishment of invasive plant species.

Cumulative impacts to vegetation would be associated with large-scale construction or development projects that would seek to clear significant areas of upland forest contiguous to the pipeline corridor. This would result in additional habitat fragmentation and would modify the vegetation classification from forest to either scrub-shrub or herbaceous classes. No such projects were identified during scoping. Additionally, development of areas adjacent to the pipeline corridor could result in the permanent loss of vegetation through the construction of residential developments, roadways and other impervious surfaces.

DTE initiated consultation regarding the Project with the PADCNR, PFBC, PGC and USFWS. DTE is working with the agencies to avoid adverse impacts to critical habitats and does not



anticipate the Project will have adverse impacts on critical habitat. DTE proposes tree clearing as allowable per consultation with USFWS to minimize or avoid potential impacts to these species.

At the time of filing, the Project is not anticipated to contribute impacts to wildlife when combined with other projects in the area.

1.9.2.2 Surface Water

The cumulative impacts on groundwater resources are expected to be temporary and limited to the construction phase of the Project. Potential impacts would be avoided or minimized by the use of both standard and specialized construction techniques, including those specified in DTE's Spill Prevention, Control, and Containment Plan (to be provided in subsequent filing).

The Project would not involve the construction of permanent diversions or dams and, therefore, would be expected to have only short-term temporary impacts on surface water quality. Temporary impacts on surface waters include disturbance of stream banks, removal of bank vegetation, and, in some instances, modification of flow during dry-crossing construction. The level of temporary impact of the proposed Project on surface waters would depend on precipitation events, sediment loads, stream area/velocity, channel integrity, and bed material.

Runoff from construction activities near waterbodies could also result in cumulative impacts, although this effect would be relatively minor and would be controlled by implementation of E&SC measures and by compliance with federal, state, and local requirements. All of the projects listed in Table 1.9-2 fall within the same HUC watershed but are typically located 0.25-mile or farther from the Project except for the Birdsboro Facility, the 2041 Box Culvert Replacement, and the SR 73/662 Corridor Safety projects. The construction of the Birdsboro Facility and the transportation projects are expected to be in compliance with all state and federal regulations as they pertain to the protection of surface water. Therefore, the pipeline is not anticipated to add to the impacts of the construction of the Birdsboro Facility as well as the transportation projects.

1.9.2.3 Cultural Resources

This Project, and other projects, are subject to National Historic Preservation Act Section 106 review and approval through delegated SHPOs, to avoid or minimize impacts and address any unavoidable impacts. Therefore, no cumulative impacts to cultural resources are anticipated.

1.9.2.4 Socioeconomics and Environmental Justice

No major aboveground facilities are proposed as part of this Project, therefore, no significant cumulative impacts for socioeconomics or economic justice are anticipated.

1.9.2.5 Soils and Geology

Potential cumulative impacts associated with geologic mineral resources may include disruption or loss of access to potential resources at mining facilities or reserves. Given that no active mining is within 0.25-mile of the Project, no anticipated cumulative impacts to mineral resources are expected.

Soil impacts will occur only during the construction period and/or post-construction monitoring period. Depending on soil conditions, these impacts may include loss of excavated soil from water and wind erosion, soil compaction from construction equipment, and mixing of topsoil and subsoil. The existing ROW crosses several properties currently being used for agricultural purposes. DTE has committed to specialized construction techniques to protect topsoil within the workspace areas and that soil productivity is maintained post-construction. The likelihood of cumulative impacts on soils is minimal and would be limited to development or construction



activities directly adjacent to the ROW that could increase the erosion potential or affect soils in agricultural or residential areas. All projects listed in Table 1.9-2 are not immediately adjacent to the Project expect for the Birdsboro Facility. The Birdsboro Facility is located within an existing disturbed industrial site. Project activities at this location will be contained with the existing site, therefore impacts are not expected to result.

1.9.2.6 Land Use and Visual Resources

Actions included in Table 1.9-2 would result in both temporary disturbances and permanent conversions of land uses. These actions may also result in temporary or permanent impacts to visual resources, including the presence of large construction vehicles and changes to the viewshed resulting from permanent buildings/structures. Portions of the permanent ROW will be located within the Birdsboro Facility, therefore land use will remain industrial in this location and no cumulative impacts are expected. No new aboveground structures will be constructed as part of the identified projects within 0.25-mile of the new pig launcher and meter site at the TETCO interconnect. The new pig receiver will be located within the Birdsboro Facility, therefore no additional changes to the viewshed will occur. The 2041 Box Culvert Replacement project is located approximately 0.29-mile east of the pipeline with construction having begun in August 2016 and expected to be completed by August 2017. The project involves the replacement of a box culvert over an unnamed tributary of Monocacy Creek. Since the project includes only the replacement of existing structures, no changes to the viewshed are anticipated. The SR 73/662 Corridor project involves the construction of a roundabout at the intersection of Route 73 and 662 in Oley Township. No changes to the viewshed are expected due to construction taking place within the existing PennDOT ROW. No major aboveground facilities are proposed as part of the Project.

Based on the anticipated impacts of the Project, along with state and local regulation of proposed actions in the Project area, it is anticipated that cumulative impacts on land use and visual resources would be insignificant.

1.9.2.7 Air Quality and Noise

All projects included in Table 1.9-2 would involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise during construction. Construction of these projects would result in temporary air emissions, but these emissions are not likely to significantly affect long-term air quality in the region. During construction, elevated levels of ambient pollutants are likely to occur in the immediate vicinity of the projects. Because pipeline construction moves through an area quickly, air emissions associated with construction of the pipeline would be intermittent and short term.

No significant aboveground facilities are proposed, therefore no cumulative impacts for air quality - operation are anticipated.

All of the projects listed in Table 1.9-2 would produce construction noise, however construction noise would be temporary to noise receptors in the vicinity and cumulative construction noise impacts are anticipated to be minimal.

No significant aboveground facilities are proposed, therefore no cumulative impacts for noise operations are anticipated.

1.9.3 Conclusions

Few development or construction projects are proposed, in progress, or recently constructed in the regions of influence of the Project, and many of these would be subject to permit requirements not unlike that of the proposed Project which will further minimize impacts to the



human and natural environment. In addition, DTE plans to implement specialized construction techniques to comply with the Commission's Plan and Procedures and carefully develop resource protection and mitigation plans through consultations with regulatory agencies designed to minimize and control environmental impacts for the Project as a whole. Therefore, the Project's contribution to cumulative impacts is anticipated to be minimal or insignificant.

1.10 References

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