

ENVIRONMENTAL ASSESSMENT
for
**River Pointe Logistics Center Planned
Industrial Park**

**UPPER MOUNT BETHEL TOWNSHIP
NORTHAMPTON COUNTY, PENNSYLVANIA**

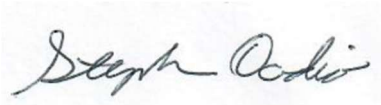
May 24, 2023

Revised August 25, 2023

Prepared For:

River Pointe Logistics, LLC
559 Main Street, Suite 300
Bethlehem, PA 18018

Prepared By:



Stephen Dadio, CPSS/CPSC/SEO

Value Engineering Inc



VE19199

Contents

S1.A Project Description	5
Past Land Use	5
Water and Wetland Resources	5
Proposed Site Improvements.....	6
Permitting and Timelines.....	6
Proposed Impacts.....	6
Table S1.A-1a. Wetland Impact Table to Jurisdictional Wetlands	6
Table S1.A-1b. Wetland Impact Table to Non-Jurisdictional Wetlands.....	7
Table S1.A-2a. Impact Table to Jurisdictional Waters	7
Table S1.A-2b. Impact Table to Non-Jurisdictional Waters	7
S1.B. Project Purpose, Need, Water Dependency	7
Table S1.B-1. Existing Wetland Inventory.....	8
Table S1.B-2 Waters Inventory.....	9
Table S1.B-3a. Wetland Impact Table to Jurisdictional Wetlands	9
Table S1.B-3b. Wetland Impact Table to Non-Jurisdictional Wetlands	10
Table S1.B-4a. Impact Table to Jurisdictional Waters.....	10
Table S1.B-4b. Impact Table to Non-Jurisdictional Waters	10
Table S1.B-5a. Impact Table to Wetlands	10
Table S1.B-5b. Impact Table to Waters.....	11
S2.1A STANDARD RESOURCE IDENTIFICATION INFORMATION	12
Table S2.A-1 Natural Features in Relation to the Project Site	13
Table S2.A-2 Prime Farmland Soils.....	14
S2.1B AQUATIC RESOURCES INVENTORY	14
Table S2.B-1. Existing Wetland Inventory.....	15
Table S2.B-2 Waters Inventory.....	16
S2.1.C Habitat for Threatened and Endangered Species	17
S2.1.D Aquatic Resource Characterization	18
Table S2.D-1. Existing Wetland Inventory.....	18
Table S2.D-2 Waters Inventory.....	19
Table S2.D-3a. Wetland Impact Table to Jurisdictional Wetlands	20
Table S2.D-3b. Wetland Impact Table to Non-Jurisdictional Wetlands	20
Table S2.D-4a. Impact Table to Jurisdictional Waters.....	21

Table S2.D-4b. Impact Table to Non-Jurisdictional Waters	21
Table S2.D-5 Rapid Condition Assessment of Impacted Wetlands and Waters.....	21
S3.A Summary of Proposed Impacts	22
Table S3.A-1. Wetland Impact Table.....	22
Table S3.A-2. Waters Impact Table.....	22
S3.B Standard Summary Responses.....	23
S3.C Subfacility Details	25
Table S3.C-1. Wetland Impact Table	25
Table S3.C-2. Waters Impact Table.....	25
S3.D Resource Function Effects	26
S3.E Antidegradation Analysis	27
S3.F – Alternatives Analysis	27
S3.G – Potential Secondary Impact Evaluation	27
S3.H – Cumulative Impacts.....	27
S4.A – Response to Proposed Wetland Impacts	28
Table S4.A-1a. Wetland Impact Table to Jurisdictional Wetlands	28
Table S4.A-1b. Wetland Impact Table to Non-Jurisdictional Wetlands.....	28
Table S4.A-2a. Impact Table to Jurisdictional Waters	28
Table S4.A-2b. Impact Table to Non-Jurisdictional Waters	29
S4.B – Details Regarding Wetland Impact Restoration	29
S4.C – Identification and Description of Mitigation Areas	29
Table S4.C-1a. Wetland Impact Table to Jurisdictional Wetlands	29
Table S4.C-1b. Wetland Impact Table to Non-Jurisdictional Wetlands	29
Table S4.C-2a. Impact Table to Jurisdictional Waters	29
Table S4.C-2b. Impact Table to Non-Jurisdictional Waters	30
Table S4.C-3. Required Wetland Mitigation Area Required	30
Soil Conditions	31
Hydrologic Conditions	31
Table S4.C4. Hydrologic Conditions for Mitigation Areas	31
Grading and Topography	31
Vegetation.....	32
Riparian Buffers	32
Maintenance Plan.....	32

S4.D – Monitoring Plans.....	33
Table S4.D-1. Performance Standards for Mitigation Areas Years 1-5.....	34
Table S4.D-2. Performance Standards for Riparian Buffer Area Years 1-5.....	34
Monitoring Periods	34
Monitoring Field Procedures	35
Depth of Water Surface and Hydrology	35
Vegetation Coverage and Composition	35
Wildlife Observed in Wetland	35
Photographs of the Site	35
Reporting	35

Appendices

S1.A Project Description

The developer, River Pointe Logistics, LLC, is proposing to construct several warehouse/distribution buildings on this property. The project site is between Potomac Street and River Road in Upper Mount Township, Northampton County, PA. The site contains 820 +/- acres, consisting of cultivated fields and managed woodlands. The property consists of twenty-five (25) tax parcels (C11 26 2; C11 31 1; C11 31 1A; C11 31 3; C11 31 4; C11 31 5; C12 3 4; C12 3 5; C12 6 1; C12 6 1A; C12 6 2; C12 6 3; C12 6 4; C12 6 4A; C12 6 4B; C12 6 4C; C12 6 4D; C12 6 4E; C12 6 5; C12 6 6; C12 6 7; C12 6 8; C12 8 1A; D11 5 1A 4; D11 6 3).

Past Land Use

The site was used in the past as agricultural farmland and was farmed until 2017. The surrounding woodlands are managed and there have been timber harvests in recent years. Historically there was a gravel pit that was utilized as a rock quarry for past construction projects; this area has been inactive for decades.

Water and Wetland Resources

The project site lies within the watershed to an Unnamed Tributary to the Delaware River, which is classified as a Cold-Water Fishery – Migratory Fished (CWF-MF) by PA-DEP. It is also classified by DEP as an attaining, or non-impaired stream.

There are four un-named tributaries East of Potomac Street which create sub-watersheds:

- Unnamed tributary 14878 – this sub-watershed is just south of PA-611 and drains the northernmost portion of the property.
- Unnamed tributary (not shown on any reference maps) – this sub-watershed is just north of Marshfield Drive and drains most of the land north of Marshfield Drive that does not drain into 1478.
- Unnamed tributary 14877 – this subwatershed drains land the western portion of the property, up to its confluence with Unnamed tributary 18982.
- Unnamed tributary 18982 – this subwatershed drains the southern portion of the property, primarily south of the gravel pit, up to its joining with the Delaware River.

The property West of Potomac Street lies within the Allegheny Creek watershed, which is classified as a Cold Water Fishery (CWF). However, there is no direct connection from any wetlands to Allegheny Creek.

There are 43 identified wetlands on the property, totaling 32.27 acres. Of these 43 identified wetlands:

- 27 are identified as Jurisdictional
 - 6 are identified as Emergent (PEM)
 - 2 are identified as Scrub/Shrub (PSS)
 - 19 are identified as Forested (PFO)
- 16 are identified as Non-Jurisdictional
 - 9 are identified as Emergent (PEM)
 - 7 are identified as Forested (PFO)

There are thirteen (13) Waters present on the property, totaling 16,468 linear feet. Of these 13 Waters:

- 8 are identified as Jurisdictional
- 5 are identified as Non-Jurisdictional

Proposed Site Improvements

The site improvements include site grading, building construction, landscaping, roadways, driveways, parking and loading areas, sidewalks, stormwater management and conveyance facilities, road improvements, utilities and other miscellaneous improvements. Earth disturbance will be minimized within the wetland and regulated floodplain areas of this property.

Permitting and Timelines

This project will not require more than one Chapter 105 permit in more than one county. This project will be completed in two phases. The first phase will involve the disturbance of 274.50 acres. The second and final phase will involve the disturbance of 275.50 acres, or a total of 550.00 acres in total disturbance.

It is anticipated that upon receiving the required Chapter 105 Joint Permit that construction will begin within 6 months of receipt of the permit. For Phase 1, construction is anticipated to take 12-24 months to complete the project. For Phase 2, construction is anticipated to take 6 to 8 years.

All areas will be stabilized and all work will be done in compliance with Chapter 102 and in accordance with the Erosion and Sediment Control Plan determined adequate by the Northampton County Conservation District.

There have been no other Chapter 105 applications submitted to DEP regarding this project.

Proposed Impacts

The project proposes to permanently impact 0.02 acres (736 square feet) of Jurisdictional Wetlands and 0.36 acres (16,024 square feet) of Non-Jurisdictional Wetlands, totaling 0.38 acres (16,760 square feet) of total impacts. The total required wetland mitigation area is, as calculated in the tables below:

Table S1.A-1a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-5	PFO	736	2:1	1,472	1,472

Table S1.A-1b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-2	PFO	1,330	2:1	2,660	2,660
WE-3	PFO	1,476	2:1	2,952	2,952
WE-4	PFO	1,803	2:1	3,606	3,606
WE-8	PEM	187	1:1	187	187
WE-14*	PEM	3,486	1:1	3,486	3,486
WE-38	PEM	454	1:1	454	454
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,070	2:1	4,140	4,140
WE-42	PEM	1,171	1:1	1,171	1,171

*-Area calculated with Wetlands WE-15, WE-16, WE-17 to a combined total.

The total impacts will be to 801 Linear Feet of Jurisdictional Waters and 384 Linear Feet of Non-Jurisdictional Waters. The total required Waters mitigation area is, as calculated in the tables below.

Table S1.A-2a. Impact Table to Jurisdictional Waters

Waters No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	205	12.31
WA-8 – Crossing 1	2,442	16.39	180	6.4
WA-8 – Crossing 2	**	**	215	11.92
WA-9	1,412	20.06	201	17.13

**-Included in above number.

Table S1.A-2b. Impact Table to Non-Jurisdictional Waters

Water No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	250	10.63
WA-4	134	7.64	134	7.64

There will be additional impacts to both Wetlands and Waters from Phase 2 construction.

S1.B. Project Purpose, Need, Water Dependency

The purpose of this project is to construct multiple warehouse/distribution buildings on this property. The project is located within a Heavy Industry Generalized Zoning Area, according to the Lehigh Valley Planning Commission. The project site is generally zoned I-2 General Industrial with a small area on the westernmost portion of the site zoned R-1 Neighborhood Residential Development. The project is proposing the construction of a planned industrial park which is a permitted use in the I-2 zone. The plan complies with zoning requirements for lot size and dimensions, setbacks, and parking

requirements. The purpose of the project is the utilization of the site in accordance with the local and regional zoning of the property.

This project will have no adverse effect to Exceptional Value (EV) wetlands or significantly adverse effects to other wetlands. The regulatory criteria for land development within Upper Mount Bethel Township seeks to maximize the environmental protection of wetlands and water resources. This project will utilize on-site wells as a water source and utilize on-lot disposal of wastewater via community sewage disposal systems.

The project was designed to reduce the amount of permanent damage to wetlands as much as possible. Of the 32.27 acres of wetlands on the property, there is proposed to be permanent impacts of only 0.02 acres (736 square feet) to Jurisdictional Wetlands and 0.36 acres (16,024 square feet) to Non-Jurisdictional Wetlands, totaling 0.38 acres (16,760 square feet) of total impacts. Mitigation is proposed to adequately compensate for the impacted areas.

The existing wetlands and water resources are listed in the table below:

Table S1.B-1. Existing Wetland Inventory

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
1	40.911942	-75.101419	92,875	2.13	PEM	Jurisdictional
2	40.906947	-75.097363	56,957	1.31	PFO	NON-Jurisdictional
3	40.904726	-75.099295	73,071	1.68	PFO	NON-Jurisdictional
4	40.910158	-75.087879	141,333	3.24	PFO	NON-Jurisdictional
5	40.907564	-75.089360	86,125	1.98	PFO	Jurisdictional
6	40.906809	-75.088325	1,676	0.04	PEM	Jurisdictional
7	40.906665	-75.088727	6,296	0.14	PEM	Jurisdictional
8	40.906173	-75.089988	5,807	0.13	PFO	NON-Jurisdictional
9	40.905791	-75.089501	10,901	0.25	PFO	NON-Jurisdictional
10-11	40.903580	-75.099375	17,403	0.40	PSS	Jurisdictional
13	40.902178	-75.099833	111,088	2.55	PFO	Jurisdictional
14,15,16,17	40.904180	-75.093343	55,339	1.27	PEM	NON-Jurisdictional
18	40.898118	-75.100707	221,831	5.09	PEM	Jurisdictional
19	40.901894	-75.095204	669	0.02	PFO	Jurisdictional
20	40.900384	-75.095835	70,286	1.61	PEM	Jurisdictional
21	40.902236	-75.091300	626	0.01	PFO	Jurisdictional
22	40.900647	-75.093143	32,083	0.74	PFO	Jurisdictional
23	40.90251	-75.091862	4,963	0.11	PEM	Jurisdictional
24	40.903724	-75.090065	7,192	0.17	PFO	Jurisdictional
25	40.900862	-75.084698	2,261	0.05	PFO	Jurisdictional
26	40.897262	-75.085667	2,203	0.05	PFO	Jurisdictional
27	40.896778	-75.085705	19,574	0.45	PFO	Jurisdictional
28-29	40.895900	-75.086427	2,857	0.07	PFO	Jurisdictional
30	40.896478	-75.086235	3,940	0.09	PFO	Jurisdictional
31	40.896831	-75.086500	17,484	0.40	PFO	Jurisdictional
32	40.89660	-75.087143	198	0.004	PFO	Jurisdictional
33	40.896960	-75.088496	41,526	0.95	PFO	Jurisdictional
34	40.895997	-75.090794	1,038	0.02	PFO	Jurisdictional
35	40.896375	-75.087760	1,372	0.03	PFO	Jurisdictional
36	40.895858	-75.088627	583	0.01	PFO	Jurisdictional
37	40.895342	-75.089757	361	0.01	PFO	Jurisdictional
38	40.906202	-75.094356	454	0.01	PEM	NON-Jurisdictional

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
39	40.905530	-75.094901	4,047	0.09	PEM	NON-Jurisdictional
40	40.894297	-75.109014	2,160	0.05	PFO	NON-Jurisdictional
41	40.905653	-75.089080	910	0.02	PFO	NON-Jurisdictional
42	40.895183	-75.101252	44,541	1.02	PEM	NON-Jurisdictional
43	40.890279	-75.107332	103,314	2.37	PEM	NON-Jurisdictional
44	40.896049	-75.107198	160,144	3.68	PEM	NON-Jurisdictional
TOTAL			1,405,488	32.27		

Table S1.B-2 Waters Inventory

Waters #	Latitude	Longitude	Size (ft ²)	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
1	40.908311	-75.086319	6,405	0.15	Unnamed Tributary to the Delaware	Jurisdictional
2	40.908867	-75.086940	6,392	0.15	Unnamed Tributary to the Delaware	NON-Jurisdictional
3	40.903648	-75.098789	3,487	0.08	Unnamed Trib 14877	Jurisdictional
4	40.904339	-75.094091	1,024	0.02	Unnamed Trib 14877	NON-Jurisdictional
5	40.900922	-75.097271	3,694	0.08	Unnamed Trib 14877	NON-Jurisdictional
6	40.901306	-75.095786	65,007	1.49	Unnamed Trib 14877	Jurisdictional
7	40.900997	-75.095267	2,979	0.07	Unnamed Trib 14877	Jurisdictional
8	40.902838	-75.095972	40,024	0.92	Unnamed Trib 14877	Jurisdictional
9	40.901089	-75.084967	28,326	0.65	Unnamed Trib 14877	Jurisdictional
10	40.901216	-75.085354	30,244	0.69	Unnamed Trib 14877	Jurisdictional
11	40.896240	-75.085790	6,844	0.16	Unnamed Trib 14877	Jurisdictional
12	40.895839	-75.089030	98,801	2.27	Unnamed Trib 18982	Jurisdictional
14	40.898500	-75.089473	5,306	0.12	Unnamed Trib 18982	NON-Jurisdictional
Pond	40.906091	-75.090997	4,373	0.10	Unnamed Trib 14877	NON-Jurisdictional
TOTAL			303,135	6.96		

The site improvements will impact wetlands and Waters. The proposed impacts are as follows:

Table S1.B-3a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-5	PFO	736	2:1	1,472	1,472

Table S1.B-3b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-2	PFO	1,330	2:1	2,660	2,660
WE-3	PFO	1,476	2:1	2,952	2,952
WE-4	PFO	1,803	2:1	3,606	3,606
WE-8	PEM	187	1:1	187	187
WE-14*	PEM	3,486	1:1	3,486	3,486
WE-38	PEM	454	1:1	454	454
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,070	2:1	4,140	4,140
WE-42	PEM	1,171	1:1	1,171	1,171

*-Area calculated with Wetlands WE-15, WE-16, WE-17 to a combined total.

The total impacts will be 801 Linear Feet of Jurisdictional Waters and 384 Linear Feet of Non-Jurisdictional Waters. The total required Waters mitigation area is, as calculated in the tables below.

Table S1.B-4a. Impact Table to Jurisdictional Waters

Waters No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	205	12.31
WA-8 – Crossing 1	2,442	16.39	180	6.4
WA-8 – Crossing 2	**	**	215	11.92
WA-9	1,412	20.06	201	17.13

**-Included in above number.

Table S1.B-4b. Impact Table to Non-Jurisdictional Waters

Waters No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	250	10.63
WA-4	134	7.64	134	7.64

The summary of both permanent and temporary direct and indirect impacts from this project are included in the table below:

Table S1.B-5a. Impact Table to Wetlands

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-2	PIPE	WE-24	X	X		
UC-3	PIPE	WE-24	X	X		
UC-4	PIPE	WE-24	X	X		
UC-5	PIPE	WE-24	X	X		

UC-6	PIPE	WE-24	X	X		
UC-11	PIPE	WE-40	X	X		
UC-12	PIPE	WE-5	X	X		
UC-13	PIPE	WE-40	X	X		
UC-14	PIPE	WE-40	X	X		
UC-19	PIPE	WE-42	X	X		
UC-20	PIPE	WE-14	X	X		
UC-21	PIPE	WE-14	X	X		
UC-22	PIPE	WE-14	X	X		
IO-2B	OUTFL	WE-14	X	X		
IO-16A	OUTFL	WE-24	X	X		
IO-16B	OUTFL	WE-24	X	X		
RC-1	CULV	WE-24	X	X		
RC-7	CULV	WE-14	X	X		
RC-8	CULV	WE-40	X	X		
G-1	WTDIM	WE-2	X	X		
G-2	WTDIM	WE-3	X	X		
G-3	WTDIM	WE-38	X	X		
G-4	WTDIM	WE-39	X	X		
G-5	WTDIM	WE-8	X	X		

Table S1.B-5b. Impact Table to Waters

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-1	PIPE	WA-12	X	X		
UC-7	PIPE	WA-10	X	X		
UC-8	PIPE	WA-10	X	X		
UC-9	PIPE	WA-10	X	X		
UC-10	PIPE	WA-10	X	X		
UC-15	PIPE	WA-2	X	X		
UC-16	PIPE	WA-2	X	X		
UC-17	PIPE	WA-2	X	X		
UC-18	PIPE	WA-2	X	X		
UC-23	PIPE	WA-4	X	X		
UC-24	PIPE	WA-4	X	X		
UC-25	PIPE	WA-8	X	X		
UC-26	PIPE	WA-8	X	X		
UC-27	PIPE	WA-8	X	X		
UC-28	PIPE	WA-8	X	X		
UC-29	PIPE	WA-8	X	X		
UC-30	PIPE	WA-8	X	X		
UC-31	PIPE	WA-8	X	X		
UC-32	PIPE	WA-8	X	X		
UC-33	PIPE	WA-8	X	X		
UC-34	PIPE	WA-8	X	X		
UC-35	PIPE	WA-1	X	X		
IO-1	OUTFL	WA-9	X	X		
IO-2A	OUTFL	WA-4	X	X		

IO-3A	OUTFL	WA-8	X	X		
IO-3B	OUTFL	WA-8	X	X		
IO-3C	OUTFL	WA-8	X	X		
IO-4A	OUTFL	WA-1	X	X		
IO-4B	OUTFL	WA-1	X	X		
IO-4C	OUTFL	WA-1	X	X		
IO-5A	OUTFL	WA-2	X	X		
IO-5B	OUTFL	WA-2	X	X		
IO-15A	OUTFL	WA-8	X	X		
IO-15B	OUTFL	WA-8	X	X		
IO-17	OUTFL	WA-9	X	X		
IO-18	OUTFL	WA-10	X	X		
RC-1	CULV	WA-9	X	X		
RC-2	CULV	WA-8	X	X		
RC-3	CULV	WA-8	X	X		
RC-4	CULV	WA-2	X	X		
RC-7	CULV	WA-4	X	X		

S2.1A STANDARD RESOURCE IDENTIFICATION INFORMATION

The Resource Identification and Characterization was completed by Stephen Dadio, CPSS/CPSC of Value Engineering Inc.

Five (5) main types of plant communities occur within the site and have been categorized as: Upland Forest, Agricultural Field Crops, Palustrine Forest, Forested Forested/Shrub and Open Palustrine. These general plant communities are briefly described in greater detail below.

Upland Forest

There are significant areas of forests throughout the property. Dominant species within this plant community are *Quercus velutina* (black oak, FACU), *Quercus rubra* (northern red oak, FACU), *Quercus alba* (white oak, FACU), *Carya ovata* (shag-bark hickory), *Fagus grandifolia* (American beech), *Fraxinus americana* (white ash), *Acer saccharum* (sugar maple, FACU), *Podophyllum L.* (mayapple, FACU), *Smilax L.* (greenbrier, FACU), *Rosa multiflora* (multiflora rose, FACU), and *Berberis thunbergii* (Japanese barberry, FACU).

Agricultural Field Crops

The crops are located throughout the property. While the fields have been fallow recently, the dominant plant species historically are *Zea mays* (corn) and *Glycine max* (soybeans). In 2019, the fallow fields had agricultural weeds present, including *Setaria pumila* (yellow foxtail, FAC), *Solidago canadensis* (Canada goldenrod, FACU), and *Cirsium arvense* (Canada thistle, FACU).

Palustrine Forest

The majority of wetlands on this property are scattered within the forested area and contain palustrine forest (PFO) vegetation. The dominant species within this plant community are *Quercus bicolor* (swamp white oak, FACW), *Quercus palustris* (pin oak, FACW), *Acer rubrum* (red maple, FACW), *Carex* (sedge, OBL), *Impatiens capensis* (jewelweed, FACW), *Juncus effuses* (soft rush, OBL), and *Symplocarpus foetidus* (skunk cabbage, OBL).

Forest/Shrub Palustrine

There are portions of the property, especially along the northern property boundary where the vegetation has both shrub and forested vegetation (PSS). The dominant species within this plant community are *Acer rubrum* (red maple, FACW), *Carex* (sedge, OBL), *Carex stricta* (upright sedge; OBL); *Impatiens capensis* (jewelweed, FACW), *Juncus effuses* (soft rush, OBL), and *Symplocarpus foetidus* (skunk cabbage, OBL).

Open Palustrine

There are several open areas of wetlands throughout the property where there is emergent vegetation (PEM). The dominant species within this plant community are *Phalaris arundinacea* (reed canarygrass; FACW), *Phragmites australis* (common reed; FACW), *Carex* (sedge, OBL), *Carex stricta* (upright sedge; OBL); *Impatiens capensis* (jewelweed, FACW), *Juncus effuses* (soft rush, OBL), and *Symplocarpus foetidus* (skunk cabbage, OBL).

The determination of the status of Jurisdictional watercourses and wetlands was completed during the Jurisdictional Determination with the US Army Corps of Engineers. Included with this module are both a location map as well as an existing features plan.

The following natural features are located within 100-ft of this project site.

Table S2.A-1 Natural Features in Relation to the Project Site

Feature located within 100-ft of Site	Yes	No
National, state, or local park, forest, or recreation area	X	
National natural landmark		X
National wildlife refuge, or Federal, state, local or private wildlife or plant sanctuaries	X	
State Game Lands		X
Source for a public water supply		X
National Wild or Scenic River of the Commonwealth's Scenic River System		X
Designated Federal wilderness area		X

The site is located adjacent to the Upper Mount Bethel Township Community Park. As part of this land development, a portion of the River Pointe property will be donated to the Township and the park acreage will be expanded. Additionally, there is no construction proposed to within 100-ft of any boundary of the current (or future) expanded park acreage.

The site is located adjacent to a local and private preserved wetland West of Potomac Street. A portion of this preserved wetland is on the River Pointe property and is labeled as WE-44. There is no proposed land development within 300-ft of this feature and the area is being utilized for a community wastewater drip disposal facility, which is designed to enhance groundwater recharge.

The following soil map units would be classified as Prime Farmland by the USDA-NRCS:

Table S2.A-2 Prime Farmland Soils

Soil Series	Soil Map Units	Soil Type	Drainage Class	Depth to Restrictive Feature	Depth to Water Table	Landform Setting	Parent Material
Conotton	CtA; CtB	Conotton 100%	Well	>80"	>80"	Terraces	Glacial Outwash
Delaware	DaA	Delaware 90%	Well	72-99" to Lithic Bedrock	>80"	Terraces	Alluvium
Manlius	MaB	Manlius 90%	Well	20-40" to Lithic Bedrock	>80"	Backslopes	Glacial Till
Penargyl	PgB	Penargyl 100%	Well	72-99" to Lithic Bedrock	>80"	Footslopes	Colluvium
Phelps	PhB	Phelps 90%	Moderately Well	>80"	18- 24"	Terraces	Glacial Outwash
Swartswood	SvB	Swartswood 90%	Well	20-36" to Fragipan	33- 36"	Backslopes	Glacial Till
Wurtsboro	WuB	Wurtsboro 90%	Moderately Well	17-28" to Fragipan; 60-120" to Lithic Bedrock	12- 30"	Footslopes	Glacial Till

S2.1B AQUATIC RESOURCES INVENTORY

There are four un-named tributaries East of Potomac Street which create sub-watersheds and drain to the Delaware River; these waters are classified as Warm Water Fisheries (WWF) and are impaired due to mercury (source unknown). There is one watershed West of Potomac Street that is located within the Allegheny Creek watershed.

- Unnamed tributary 14878 – this sub-watershed is just south of PA-611 and drains the northernmost portion of the property.
- Unnamed tributary (not shown on any reference maps) – this sub-watershed is just north of Marshfield Drive and drains most of the land north of Marshfield Drive that does not drain into 1478.
- Unnamed tributary 14877 – this subwatershed drains land the western portion of the property, up to its confluence with Unnamed tributary 18982.
- Unnamed tributary 18982 – this subwatershed drains the southern portion of the property, primarily south of the gravel pit, up to its joining with the Delaware River.
- The property West of Potomac Street lies within the Allegheny Creek watershed, which is classified as a Cold Water Fishery (CWF). However, there is no direct connection from any wetlands to Allegheny Creek.

The National Wetland Inventory (NWI) map has identified seven (7) features on the site. The features are as follows:

- 1.26 acre pond (PUBHh)
- 1.15 isolated freshwater forested shrub wetland (PFO1B)
- 0.28 isolated freshwater forested shrub wetland (PFO1B)
- 0.87 freshwater forested shrub wetland associated with unnamed trib. 14877 (PFO1B)
- 0.52 freshwater forested shrub wetland associated with unnamed trib. 14877 (PSS1E)
- 0.44 freshwater forested shrub wetland associated with unnamed trib. 18982 (PFO1B)
- 26.69 freshwater forested shrub wetland (PFO1E) along the Northwestern property line of the site West of Potomac Street

There are 43 identified wetlands on the property, totaling 32.27 acres. Of these 43 identified wetlands:

- 27 are identified as Jurisdictional
- 6 are identified as Emergent (PEM)
- 2 are identified as Scrub/Shrub (PSS)
- 19 are identified as Forested (PFO)
- 16 are identified as Non-Jurisdictional
- 9 are identified as Emergent (PEM)
- 7 are identified as Forested (PFO)

There are thirteen (13) Waters present on the property, totaling 16,468 linear feet. Of these 13 Waters:

- 8 are identified as Jurisdictional
- 5 are identified as Non-Jurisdictional

Table S2.B-1. Existing Wetland Inventory

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
1	40.911942	-75.101419	92,875	2.13	PEM	Jurisdictional
2	40.906947	-75.097363	56,957	1.31	PFO	NON-Jurisdictional
3	40.904726	-75.099295	73,071	1.68	PFO	NON-Jurisdictional
4	40.910158	-75.087879	141,333	3.24	PFO	NON-Jurisdictional
5	40.907564	-75.089360	86,125	1.98	PFO	Jurisdictional
6	40.906809	-75.088325	1,676	0.04	PEM	Jurisdictional
7	40.906665	-75.088727	6,296	0.14	PEM	Jurisdictional
8	40.906173	-75.089988	5,807	0.13	PFO	NON-Jurisdictional
9	40.905791	-75.089501	10,901	0.25	PFO	NON-Jurisdictional
10-11	40.903580	-75.099375	17,403	0.40	PSS	Jurisdictional
13	40.902178	-75.099833	111,088	2.55	PFO	Jurisdictional
14,15,16,17	40.904180	-75.093343	55,339	1.27	PEM	NON-Jurisdictional
18	40.898118	-75.100707	221,831	5.09	PEM	Jurisdictional
19	40.901894	-75.095204	669	0.02	PFO	Jurisdictional
20	40.900384	-75.095835	70,286	1.61	PEM	Jurisdictional
21	40.902236	-75.091300	626	0.01	PFO	Jurisdictional
22	40.900647	-75.093143	32,083	0.74	PFO	Jurisdictional

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
23	40.90251	-75.091862	4,963	0.11	PEM	Jurisdictional
24	40.903724	-75.090065	7,192	0.17	PFO	Jurisdictional
25	40.900862	-75.084698	2,261	0.05	PFO	Jurisdictional
26	40.897262	-75.085667	2,203	0.05	PFO	Jurisdictional
27	40.896778	-75.085705	19,574	0.45	PFO	Jurisdictional
28-29	40.895900	-75.086427	2,857	0.07	PFO	Jurisdictional
30	40.896478	-75.086235	3,940	0.09	PFO	Jurisdictional
31	40.896831	-75.086500	17,484	0.40	PFO	Jurisdictional
32	40.89660	-75.087143	198	0.004	PFO	Jurisdictional
33	40.896960	-75.088496	41,526	0.95	PFO	Jurisdictional
34	40.895997	-75.090794	1,038	0.02	PFO	Jurisdictional
35	40.896375	-75.087760	1,372	0.03	PFO	Jurisdictional
36	40.895858	-75.088627	583	0.01	PFO	Jurisdictional
37	40.895342	-75.089757	361	0.01	PFO	Jurisdictional
38	40.906202	-75.094356	454	0.01	PEM	NON-Jurisdictional
39	40.905530	-75.094901	4,047	0.09	PEM	NON-Jurisdictional
40	40.894297	-75.109014	2,160	0.05	PFO	NON-Jurisdictional
41	40.905653	-75.089080	910	0.02	PFO	NON-Jurisdictional
42	40.895183	-75.101252	44,541	1.02	PEM	NON-Jurisdictional
43	40.890279	-75.107332	103,314	2.37	PEM	NON-Jurisdictional
44	40.896049	-75.107198	160,144	3.68	PEM	NON-Jurisdictional
TOTAL			1,405,488	32.27		

Table S2.B-2 Waters Inventory

Waters #	Latitude	Longitude	Size (ft ²)	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
1	40.908311	-75.086319	6,405	0.15	Unnamed Tributary to the Delaware	Jurisdictional
2	40.908867	-75.086940	6,392	0.15	Unnamed Tributary to the Delaware	NON-Jurisdictional
3	40.903648	-75.098789	3,487	0.08	Unnamed Trib 14877	Jurisdictional
4	40.904339	-75.094091	1,024	0.02	Unnamed Trib 14877	NON-Jurisdictional
5	40.900922	-75.097271	3,694	0.08	Unnamed Trib 14877	NON-Jurisdictional
6	40.901306	-75.095786	65,007	1.49	Unnamed Trib 14877	Jurisdictional
7	40.900997	-75.095267	2,979	0.07	Unnamed Trib 14877	Jurisdictional
8	40.902838	-75.095972	40,024	0.92	Unnamed Trib 14877	Jurisdictional
9	40.901089	-75.084967	28,326	0.65	Unnamed Trib 14877	Jurisdictional
10	40.901216	-75.085354	30,244	0.69	Unnamed Trib 14877	Jurisdictional
11	40.896240	-75.085790	6,844	0.16	Unnamed Trib 14877	Jurisdictional

Waters #	Latitude	Longitude	Size (ft ²)	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
12	40.895839	-75.089030	98,801	2.27	Unnamed Trib 18982	Jurisdictional
14	40.898500	-75.089473	5,306	0.12	Unnamed Trib 18982	NON-Jurisdictional
Pond	40.906091	-75.090997	4,373	0.10	Unnamed Trib 14877	NON-Jurisdictional
TOTAL			303,135	6.96		

Information regarding the delineated wetlands and riverine features are included in the Wetlands Report.

There are no special protection waters anywhere on the property. As there have been bog turtles historically found in wetlands #1 and #18, these wetlands would be classified as Exceptional Value wetlands.

S2.1.C Habitat for Threatened and Endangered Species

PNDI database searches have been performed for the property and are provided in Appendix C. The search identified potential conflicts with the following threatened/endangered species:

Original PNDI Search 724934

This PNDI search, dated July 20, 2021, involved the original property configuration.

- US Fish & Wildlife Service
 - 2 potential conflicts: Bog Turtle and Indiana Bat
 - The US Fish & Wildlife Service has reviewed the PNDI and bog turtle assessment report and we are awaiting comments.
 - The US Fish & Wildlife Service has reviewed the PNDI and bat study and we are awaiting comments.
- PA Fish and Boat Commission
 - 1 potential conflict: Bog Turtle
 - We are awaiting the review from the US Fish & Wildlife Service review.
- Department of Conservation and Natural Resources (DCNR)
 - A Pennsylvania Natural Diversity Index (PNDI) search identified fourteen (14) Species of Special Concern (SOSC) on the property.
 - The species of concern include Yellow Sedge, Prairie Sedge, Sterile Sedge, A Sedge, Scarlet Indian-paintbrush, Matted Spike-rush, Thin-leaved Cotton-grass, Baltic Rush,

Brook Lobelia, Wiry Witchgrass, Carolina Grass-of Parnassus, Whorled Nutrush, Bog Goldenrod, Spreading Globeflower.

- Detailed surveys were completed in 2018 and 2019 by an environmental professional that holds a PADCNR Wild Plant Management Permit.
- This report was submitted to the PA DCNR for their review on June 10, 2020.
- A clearance letter was provided by DCNR on August 11, 2021.

Additional PNDI Searches

On September 9, 2021, additional PNDI database searches were performed for parcels not included in the initial search, as follows:

- PNDI 742384 – parcel D11 5 1A 4
- PNDI 742389 – parcel C12 8 1A

Draft copies of the above PNDI searches are provided in Appendix C and both indicate potential conflicts with PA Fish and Boat Commission and US Fish & Wildlife Service. Additional information will be submitted in response to these searches to obtain clearances for these additional parcels.

S2.1.D Aquatic Resource Characterization

The Rapid Assessment Protocols for the Riverine and Wetland Resources that will be impacted by this project are summarized in the table below. There are no Lacustrine Resources on this site.

There are 43 identified wetlands on the property, totaling 32.27 acres. Of these 43 identified wetlands:

- 27 are identified as Jurisdictional
 - 6 are identified as Emergent (PEM)
 - 2 are identified as Scrub/Shrub (PSS)
 - 19 are identified as Forested (PFO)
- 16 are identified as Non-Jurisdictional
 - 9 are identified as Emergent (PEM)
 - 7 are identified as Forested (PFO)

There are thirteen (13) Waters present on the property, totaling 16,468 linear feet. Of these 13 Waters:

- 8 are identified as Jurisdictional
- 5 are identified as Non-Jurisdictional

Table S2.D-1. Existing Wetland Inventory

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
1	40.911942	-75.101419	92,875	2.13	PEM	Jurisdictional

Wetland #	Latitude	Longitude	Size (ft ²)	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
2	40.906947	-75.097363	56,957	1.31	PFO	NON-Jurisdictional
3	40.904726	-75.099295	73,071	1.68	PFO	NON-Jurisdictional
4	40.910158	-75.087879	141,333	3.24	PFO	NON-Jurisdictional
5	40.907564	-75.089360	86,125	1.98	PFO	Jurisdictional
6	40.906809	-75.088325	1,676	0.04	PEM	Jurisdictional
7	40.906665	-75.088727	6,296	0.14	PEM	Jurisdictional
8	40.906173	-75.089988	5,807	0.13	PFO	NON-Jurisdictional
9	40.905791	-75.089501	10,901	0.25	PFO	NON-Jurisdictional
10-11	40.903580	-75.099375	17,403	0.40	PSS	Jurisdictional
13	40.902178	-75.099833	111,088	2.55	PFO	Jurisdictional
14,15,16,17	40.904180	-75.093343	55,339	1.27	PEM	NON-Jurisdictional
18	40.898118	-75.100707	221,831	5.09	PEM	Jurisdictional
19	40.901894	-75.095204	669	0.02	PFO	Jurisdictional
20	40.900384	-75.095835	70,286	1.61	PEM	Jurisdictional
21	40.902236	-75.091300	626	0.01	PFO	Jurisdictional
22	40.900647	-75.093143	32,083	0.74	PFO	Jurisdictional
23	40.90251	-75.091862	4,963	0.11	PEM	Jurisdictional
24	40.903724	-75.090065	7,192	0.17	PFO	Jurisdictional
25	40.900862	-75.084698	2,261	0.05	PFO	Jurisdictional
26	40.897262	-75.085667	2,203	0.05	PFO	Jurisdictional
27	40.896778	-75.085705	19,574	0.45	PFO	Jurisdictional
28-29	40.895900	-75.086427	2,857	0.07	PFO	Jurisdictional
30	40.896478	-75.086235	3,940	0.09	PFO	Jurisdictional
31	40.896831	-75.086500	17,484	0.40	PFO	Jurisdictional
32	40.89660	-75.087143	198	0.004	PFO	Jurisdictional
33	40.896960	-75.088496	41,526	0.95	PFO	Jurisdictional
34	40.895997	-75.090794	1,038	0.02	PFO	Jurisdictional
35	40.896375	-75.087760	1,372	0.03	PFO	Jurisdictional
36	40.895858	-75.088627	583	0.01	PFO	Jurisdictional
37	40.895342	-75.089757	361	0.01	PFO	Jurisdictional
38	40.906202	-75.094356	454	0.01	PEM	NON-Jurisdictional
39	40.905530	-75.094901	4,047	0.09	PEM	NON-Jurisdictional
40	40.894297	-75.109014	2,160	0.05	PFO	NON-Jurisdictional
41	40.905653	-75.089080	910	0.02	PFO	NON-Jurisdictional
42	40.895183	-75.101252	44,541	1.02	PEM	NON-Jurisdictional
43	40.890279	-75.107332	103,314	2.37	PEM	NON-Jurisdictional
44	40.896049	-75.107198	160,144	3.68	PEM	NON-Jurisdictional
TOTAL			1,405,488	32.27		

Table S2.D-2 Waters Inventory

Waters #	Latitude	Longitude	Size (ft ²)	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
1	40.908311	-75.086319	6,405	0.15	Unnamed Tributary to the Delaware	Jurisdictional
2	40.908867	-75.086940	6,392	0.15	Unnamed Tributary to the Delaware	NON-Jurisdictional
3	40.903648	-75.098789	3,487	0.08	Unnamed Trib 14877	Jurisdictional

Waters #	Latitude	Longitude	Size (ft ²)	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
4	40.904339	-75.094091	1,024	0.02	Unnamed Trib 14877	NON-Jurisdictional
5	40.900922	-75.097271	3,694	0.08	Unnamed Trib 14877	NON-Jurisdictional
6	40.901306	-75.095786	65,007	1.49	Unnamed Trib 14877	Jurisdictional
7	40.900997	-75.095267	2,979	0.07	Unnamed Trib 14877	Jurisdictional
8	40.902838	-75.095972	40,024	0.92	Unnamed Trib 14877	Jurisdictional
9	40.901089	-75.084967	28,326	0.65	Unnamed Trib 14877	Jurisdictional
10	40.901216	-75.085354	30,244	0.69	Unnamed Trib 14877	Jurisdictional
11	40.896240	-75.085790	6,844	0.16	Unnamed Trib 14877	Jurisdictional
12	40.895839	-75.089030	98,801	2.27	Unnamed Trib 18982	Jurisdictional
14	40.898500	-75.089473	5,306	0.12	Unnamed Trib 18982	NON-Jurisdictional
Pond	40.906091	-75.090997	4,373	0.10	Unnamed Trib 14877	NON-Jurisdictional
TOTAL			303,135	6.96		

It is proposed that the project will impact 10 wetlands and 5 Waters. The proposed impacts are as follows:

Table S2.D-3a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-5	PFO	736	2:1	1,472	1,472

Table S2.D-3b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-2	PFO	1,330	2:1	2,660	2,660
WE-3	PFO	1,476	2:1	2,952	2,952
WE-4	PFO	1,803	2:1	3,606	3,606
WE-8	PEM	187	1:1	187	187
WE-14*	PEM	3,486	1:1	3,486	3,486
WE-38	PEM	454	1:1	454	454
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,070	2:1	4,140	4,140
WE-42	PEM	1,171	1:1	1,171	1,171

*-Area calculated with Wetlands WE-15, WE-16, WE-17 to a combined total.

The project proposes to permanently impact 0.02 acres (736 square feet) of Jurisdictional Wetlands and 0.36 acres (16,024 square feet) of Non-Jurisdictional Wetlands, totaling 0.38 acres (20,768 square feet) of total impacts. The total impacts will be 801 Linear Feet of Jurisdictional Waters and 384 Linear Feet of Non-Jurisdictional Waters. The total required Waters mitigation area is, as calculated in the tables below.

Table S2.D-4a. Impact Table to Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	116	12.3
WA-8	2,442	16.39	857	26.4
WA-9	1,412	20.06	900	15.4
WA-10	1,433	21.10	567	8.4
WA-12	5,146	16.11	30	4

Table S2.D-4b. Impact Table to Non-Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	487	11.57
WA-4	134	8.30	231	18.67
WA-14	609	8.71	13	10

The Rapid Condition Assessment of Each Feature is listed in the table below.

Table S2.D-5 Rapid Condition Assessment of Impacted Wetlands and Waters

Feature	Riverine Condition Index	Wetland Condition Index
WA-1	0.55	---
WA-2	0.66	---
WA-4	0.44	---
WA-5	0.41	---
WA-6	0.80	---
WA-8	0.63	---
WA-9	0.79	---
WA-14	0.31	---
WE-2	---	0.90
WE-3	---	0.91
WE-5	---	0.87
WE-8	---	0.83
WE-14	---	0.79
WE-24	---	0.80
WE-38	---	0.77

WE-39	---	0.77
WE-40	---	0.94

S3.A Summary of Proposed Impacts

The summary of both permanent and temporary direct and indirect impacts from this project are included in the table below:

Table S3.A-1. Wetland Impact Table

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-2	PIPE	WE-24	X	X		
UC-3	PIPE	WE-24	X	X		
UC-4	PIPE	WE-24	X	X		
UC-5	PIPE	WE-24	X	X		
UC-6	PIPE	WE-24	X	X		
UC-11	PIPE	WE-40	X	X		
UC-12	PIPE	WE-5	X	X		
UC-13	PIPE	WE-40	X	X		
UC-14	PIPE	WE-40	X	X		
UC-19	PIPE	WE-42	X	X		
UC-20	PIPE	WE-14	X	X		
UC-21	PIPE	WE-14	X	X		
UC-22	PIPE	WE-14	X	X		
IO-2B	OUTFL	WE-14	X	X		
IO-16A	OUTFL	WE-24	X	X		
IO-16B	OUTFL	WE-24	X	X		
RC-1	CULV	WE-24	X	X		
RC-7	CULV	WE-14	X	X		
RC-8	CULV	WE-40	X	X		
G-1	WTDIM	WE-2	X	X		
G-2	WTDIM	WE-3	X	X		
G-3	WTDIM	WE-38	X	X		
G-4	WTDIM	WE-39	X	X		
G-5	WTDIM	WE-8	X	X		

Table S3.A-2. Waters Impact Table

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-1	PIPE	WA-12	X	X		
UC-7	PIPE	WA-10	X	X		
UC-8	PIPE	WA-10	X	X		
UC-9	PIPE	WA-10	X	X		
UC-10	PIPE	WA-10	X	X		
UC-15	PIPE	WA-2	X	X		
UC-16	PIPE	WA-2	X	X		
UC-17	PIPE	WA-2	X	X		

UC-18	PIPE	WA-2	X	X		
UC-23	PIPE	WA-4	X	X		
UC-24	PIPE	WA-4	X	X		
UC-25	PIPE	WA-8	X	X		
UC-26	PIPE	WA-8	X	X		
UC-27	PIPE	WA-8	X	X		
UC-28	PIPE	WA-8	X	X		
UC-29	PIPE	WA-8	X	X		
UC-30	PIPE	WA-8	X	X		
UC-31	PIPE	WA-8	X	X		
UC-32	PIPE	WA-8	X	X		
UC-33	PIPE	WA-8	X	X		
UC-34	PIPE	WA-8	X	X		
UC-35	PIPE	WA-1	X	X		
IO-1	OUTFL	WA-9	X	X		
IO-2A	OUTFL	WA-4	X	X		
IO-3A	OUTFL	WA-8	X	X		
IO-3B	OUTFL	WA-8	X	X		
IO-3C	OUTFL	WA-8	X	X		
IO-4A	OUTFL	WA-1	X	X		
IO-4B	OUTFL	WA-1	X	X		
IO-4C	OUTFL	WA-1	X	X		
IO-5A	OUTFL	WA-2	X	X		
IO-5B	OUTFL	WA-2	X	X		
IO-15A	OUTFL	WA-8	X	X		
IO-15B	OUTFL	WA-8	X	X		
IO-17	OUTFL	WA-9	X	X		
IO-18	OUTFL	WA-10	X	X		
RC-1	CULV	WA-9	X	X		
RC-2	CULV	WA-8	X	X		
RC-3	CULV	WA-8	X	X		
RC-4	CULV	WA-2	X	X		
RC-7	CULV	WA-4	X	X		

S3.B Standard Summary Responses

The following impacts are anticipated through the construction of this proposed project. These impacts are presented on the Wetlands and Waters Impact Exhibit included in this Module. These impacts are grouped together as there are 24 impacts to Wetlands and 42 impacts to Waters. In the Wetlands and Waters exhibits, there are detailed descriptions for each proposed impact to each individual

Pipe Crossing Impacts: There are 35 pipe crossing impacts to both Wetlands and Waters; these are utility crossings, including irrigation, sanitary, electric, water, gas, and sanitary crossings. The purposes of these crossings are to provide these needed utilities to the proposed industrial buildings.

The pipe crossings will be completed one of two ways; either with direct drilling under the impacted resource or through trenching and backfilling. The area above the utility trenches will be backfilled to original grades and elevations (or to grades and elevations as approved for the pipe culvert

installation). Backfill material will be suitable previously excavated backfill material or new crushed stone.

All areas will be stabilized and all work will be done in compliance with Chapter 102 and in accordance with the Erosion and Sediment Control Plan determined adequate by the Northampton County Conservation District.

Intake and Outfall Structure Impacts: There are 18 intake and outfall structure impacts. These impacts consist of endwalls and headwalls that are associated with the natural flow of the water on the property (e.g. IO-1 Pond 2 Discharge) to discharge points from the existing stormwater management plan for this proposed project.

All areas will be stabilized and all work will be done in compliance with Chapter 102 and in accordance with the Erosion and Sediment Control Plan determined adequate by the Northampton County Conservation District.

Road Crossing Impacts: There are 6 road crossing impacts. The number of crossings is very small in proportion to the overall scope of the project; care was taken to minimize the number of crossings. The purpose of these crossings is to connect the proposed industrial buildings to Marshfield Drive. Marshfield Drive is being re-routed to follow a new path that minimizes impacts to both Wetlands and Waters. Crossing impacts will consist of large box culverts across the unnamed tributaries to the Delaware River.

All areas will be stabilized and all work will be done in compliance with Chapter 102 and in accordance with the Erosion and Sediment Control Plan determined adequate by the Northampton County Conservation District.

Grading Impacts: There are 5 grading impacts that will impact Non-Jurisdictional wetlands. These impacts include the following:

- G1; 1,330 sq. ft. – this impact to Wetland #2 is associated with the grading of the parking facilities for Lot #6. This impact is associated with a very small portion of Wetland #2.
- G-2; 147 sq. ft. - this impact to Wetland #3 is associated with the grading of the parking facilities for Lot #6. This impact is associated with a very small portion of Wetland #3.
- G-3; 4,046 sq. ft. – this impact to Wetland 38 is associated with the construction of the industrial building at Lot #6. This area of wetlands that was created by past grading (e.g. cutting) of the soil; the area is highly disturbed and the Wetland Condition Index is 0.77.
- G-4; 446 sq. ft. – this impact to Wetland 38 is associated with the construction of the industrial building at Lot #6. This area of wetlands that was created by past grading (e.g. cutting) of the soil; the area is highly disturbed and the Wetland Condition Index is 0.77.
- G-5; 178 sq. ft. – this impact to Wetland 8 is associated with the grading of the access road to Lot 3C. The impact is associated with a very small portion of Wetland #8.

To compensate for the loss of this small portion of wetland caused by this impact, the developer is creating wetlands in nearby areas on the property through mitigation at ratios of 2:1 for Forested Wetlands and 1:1 for Non-Forested Wetlands.

All areas will be stabilized and all work will be done in compliance with Chapter 102 and in accordance with the Erosion and Sediment Control Plan determined adequate by the Northampton County Conservation District.

S3.C Subfacility Details

The subfacility details of each temporary or permanent direct or indirect impact are listed in the table below. The impacts include outfalls, utility lines, filling, and culverts.

Table S3.C-1. Wetland Impact Table

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-2	PIPE	WE-24	X	X		
UC-3	PIPE	WE-24	X	X		
UC-4	PIPE	WE-24	X	X		
UC-5	PIPE	WE-24	X	X		
UC-6	PIPE	WE-24	X	X		
UC-11	PIPE	WE-40	X	X		
UC-12	PIPE	WE-5	X	X		
UC-13	PIPE	WE-40	X	X		
UC-14	PIPE	WE-40	X	X		
UC-19	PIPE	WE-42	X	X		
UC-20	PIPE	WE-14	X	X		
UC-21	PIPE	WE-14	X	X		
UC-22	PIPE	WE-14	X	X		
IO-2B	OUTFL	WE-14	X	X		
IO-16A	OUTFL	WE-24	X	X		
IO-16B	OUTFL	WE-24	X	X		
RC-1	CULV	WE-24	X	X		
RC-7	CULV	WE-14	X	X		
RC-8	CULV	WE-40	X	X		
G-1	WTDIM	WE-2	X	X		
G-2	WTDIM	WE-3	X	X		
G-3	WTDIM	WE-38	X	X		
G-4	WTDIM	WE-39	X	X		
G-5	WTDIM	WE-8	X	X		

Table S3.C-2. Waters Impact Table

Impact No.	Impact Type	Affected Resources	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
UC-1	PIPE	WA-12	X	X		
UC-7	PIPE	WA-10	X	X		
UC-8	PIPE	WA-10	X	X		
UC-9	PIPE	WA-10	X	X		
UC-10	PIPE	WA-10	X	X		
UC-15	PIPE	WA-2	X	X		
UC-16	PIPE	WA-2	X	X		
UC-17	PIPE	WA-2	X	X		
UC-18	PIPE	WA-2	X	X		
UC-23	PIPE	WA-4	X	X		
UC-24	PIPE	WA-4	X	X		
UC-25	PIPE	WA-8	X	X		

UC-26	PIPE	WA-8	X	X		
UC-27	PIPE	WA-8	X	X		
UC-28	PIPE	WA-8	X	X		
UC-29	PIPE	WA-8	X	X		
UC-30	PIPE	WA-8	X	X		
UC-31	PIPE	WA-8	X	X		
UC-32	PIPE	WA-8	X	X		
UC-33	PIPE	WA-8	X	X		
UC-34	PIPE	WA-8	X	X		
UC-35	PIPE	WA-1	X	X		
IO-1	OUTFL	WA-9	X	X		
IO-2A	OUTFL	WA-4	X	X		
IO-3A	OUTFL	WA-8	X	X		
IO-3B	OUTFL	WA-8	X	X		
IO-3C	OUTFL	WA-8	X	X		
IO-4A	OUTFL	WA-1	X	X		
IO-4B	OUTFL	WA-1	X	X		
IO-4C	OUTFL	WA-1	X	X		
IO-5A	OUTFL	WA-2	X	X		
IO-5B	OUTFL	WA-2	X	X		
IO-15A	OUTFL	WA-8	X	X		
IO-15B	OUTFL	WA-8	X	X		
IO-17	OUTFL	WA-9	X	X		
IO-18	OUTFL	WA-10	X	X		
RC-1	CULV	WA-9	X	X		
RC-2	CULV	WA-8	X	X		
RC-3	CULV	WA-8	X	X		
RC-4	CULV	WA-2	X	X		
RC-7	CULV	WA-4	X	X		

S3.D Resource Function Effects

Considering the size and scope of this project, there is a minimal impact on wetlands and riverine resources. There should be no changes in hydrologic, biogeochemical, habitat, and recreation function of these riverine features.

All work is being completed in accordance with Chapter 102 and 105 regulations to reduce the number of potential impacts that would adversely affect water quality and species habitats.

This project will not adversely impact fisheries or the ability of water to support and provide habitat for aquatic and/or avian species. No riparian rights to these waters will be impacted by the proposed project.

Prime Farmland Impact Justification

The project is located within a Heavy Industry Generalized Zoning Area, according to the Lehigh Valley Planning Commission. The project site is generally zoned I-2 General Industrial with a small area on the westernmost portion of the site zoned R-1 Neighborhood Residential Development. The project is proposing the construction of a planned industrial park which is a permitted use in the I-2 zone. The plan complies with zoning requirements for lot size and dimensions, setbacks, and parking

requirements. The purpose of the project is the utilization of the site in accordance with the local and regional zoning of the property.

These zoning classifications were made with the knowledge that Prime Farmland soils were located on this property. Considering that both the local and regional planning agencies have determined that these soils are suitable for commercial use, there should not be any restrictions on impacts on these Prime Farmland soils within these zoning districts.

S3.E Antidegradation Analysis

This project will have no adverse impacts on the designated stream use on this property. All work is being completed in accordance with Chapter 102 and 105 regulations.

A hydrological evaluation is provided for the 2, 10, 25, 50 and 100-year design storm events utilizing the Urban Hydrology for Small Watershed TR-55 method. Per the Upper Mount Bethel Township Ordinance and ACT 167 Plan, the post-development runoff rates are not to exceed the pre-development runoff rates. The project site area is located within drainage districts 143, 144, and 145 of the Martins/Jacoby Creeks Watershed as delineated in the ACT 167 Plan. Per the Township Ordinances and Act 167 Plan, "Development proposals which, through groundwater recharge or other means, do not increase either the rate or volume of runoff discharged from the site compared to pre-development are not subject to the release rate provisions of this Ordinance". The proposed project plans to meet the requirements for drainage districts 143-145 by not increasing from pre-development peak flows for each of the storm events.

S3.F – Alternatives Analysis

Given the existing site conditions, there are few practicable alternatives that would avoid or minimize the adverse impacts of the dam, water obstruction(s) and/or encroachment(s) beyond what has already been proposed.

The applicant has taken the steps to minimize impacts from the proposed development through the management of stormwater on-site, utilizing recharge systems.

Runoff volumes for the site were modeled utilizing Hydraflow Hydrographs 2007 v9.1 computer software, utilizing the Urban Hydrology for Small Watershed TR-55 method for the applicable design storms. The 2-, 10-, 50- and 100-year design rainfall depths were obtained from NOAA Atlas 14 for the site with a Type II distribution. The rainfall depths values are based upon the associated Hydrological Soil Groups and land cover.

S3.G – Potential Secondary Impact Evaluation

There will be no secondary impacts on adjacent parcels or downstream properties as the proposed project will minimize any negative impacts and seek to maintain the current hydrology of these riverine resources. This project is downstream of a decommissioned power plant; any impacts to riverine resources, however minute, would go to the Delaware River.

S3.H – Cumulative Impacts

There will be no cumulative impacts on adjacent parcels or downstream properties as the proposed project will minimize any negative impacts and seek to maintain the current hydrology of these riverine resources. This project is downstream of a decommissioned power plant; any impacts to riverine

resources, however minute, would go to the Delaware River and not impact downstream property owners.

S4.A – Response to Proposed Wetland Impacts

There are approximately 32.27 acres of wetlands on this site and 6.96 acres of Waters. The project has been completed to minimize the number of wetlands and Waters impacted on this site.

It is proposed that the project will impact 10 wetlands and 5 Waters. The proposed impacts are as follows:

Table S4.A-1a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-5	PFO	736	2:1	1,472	1,472

Table S4.A-1b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-2	PFO	1,330	2:1	2,660	2,660
WE-3	PFO	1,476	2:1	2,952	2,952
WE-4	PFO	1,803	2:1	3,606	3,606
WE-8	PEM	187	1:1	187	187
WE-14*	PEM	3,486	1:1	3,486	3,486
WE-38	PEM	454	1:1	454	454
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,070	2:1	4,140	4,140
WE-42	PEM	1,171	1:1	1,171	1,171

*-Area calculated with Wetlands WE-15, WE-16, WE-17 to a combined total.

Of the 32.27 acres of wetlands on the property, there is proposed to be permanent impacts of only 0.02 acres (736 square feet) to Jurisdictional Wetlands and 0.36 acres (16,024 square feet) to Non-Jurisdictional Wetlands, totaling 0.38 acres (16,760 square feet) of total impacts.

The total impacts will be 801 Linear Feet of Jurisdictional Waters and 384 Linear Feet of Non-Jurisdictional Waters. The total required Waters mitigation area is, as calculated in the tables below.

Table S4.A-2a. Impact Table to Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	205	12.31
WA-8 – Crossing 1	2,442	16.39	180	6.4
WA-8 – Crossing 2	**	**	215	11.92
WA-9	1,412	20.06	201	17.13

**-Included in the above total.

Table S4.A-2b. Impact Table to Non-Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	250	10.63
WA-4	134	7.64	134	7.64

All measures were taken with this design to minimize unavoidable resource impacts.

S4.B – Details Regarding Wetland Impact Restoration

The permanent wetland impacts are being mitigated at the required 1:1 and 2:1 ratios as illustrated in S4.C below. The temporary impacts are included in the design details for this project, which are included with this Environmental Assessment.

S4.C – Identification and Description of Mitigation Areas

The purpose of the proposed wetland mitigation project is to offset wetland impacts anticipated to result from construction of the proposed River Pointe Logistics Planned Industrial Park.

The project proposes to permanently impact 0.38 acres (16,760 square feet) of wetlands and 1,185 linear feet of Waters. The total required wetland mitigation area is, as calculated in the table below:

Table S4.C-1a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-5	PFO	736	2:1	1,472	1,472

Table S4.C-1b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft ²)	Mitigation Ratio	Required Mitigation Area (ft ²)	Provided Mitigation Area (ft ²)
WE-2	PFO	1,330	2:1	2,660	2,660
WE-3	PFO	1,476	2:1	2,952	2,952
WE-4	PFO	1,803	2:1	3,606	3,606
WE-8	PEM	187	1:1	187	187
WE-14*	PEM	3,486	1:1	3,486	3,486
WE-38	PEM	454	1:1	454	454
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,070	2:1	4,140	4,140

*-Area calculated with Wetlands WE-15, WE-16, WE-17 to a combined total.

Table S4.C-2a. Impact Table to Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	205	12.31

WA-8 – Crossing 1	2,442	16.39	180	6.4
WA-8 – Crossing 2	**	**	215	11.92
WA-9	1,412	20.06	201	17.13

**-Included in the above total.

Table S4.C-2b. Impact Table to Non-Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	250	10.63
WA-4	134	7.64	134	7.64

Originally, it was proposed to utilize a mitigation bank in accordance with the requirements set forth in the most current DEP Chapter 105 Guidance. Unfortunately, there are no wetland banks in close proximity to this project site and on-site mitigation will be required.

The property owner/developer will be responsible for constructing and maintaining the wetland mitigation project. They will also be responsible for monitoring and protecting the mitigation site subsequent to construction completion. Once the wetland mitigation project is constructed, the new wetland will be monitored for five years. Within the first two years, a monitoring report will be filed every six months. Within the following years, monitoring reports will be filed annually. An as-built survey will be performed once construction of the wetland is completed. The as-built survey will record the topography and limits of the proposed mitigation area.

The proposed wetland mitigation site was selected during field visits with representatives from the US Army Corps of Engineers with input from PADEP. The wetland mitigation sites were selected because of its close proximity to the project and proposed impacts as well as their ability to meet the required 1:1 ratio for wetland impacts. While one complete mitigation area was originally considered, it did not fit with the design of the project. The three mitigation areas are provided to address current and future impacts to wetlands. The locations were chosen due to their location between Wetland # 14 and the unnamed tributary to the Delaware River. The wetland mitigation and riparian areas are shown in the attached Mitigation Plan and summarized in the Table below.

Table S4.C-3. Required Wetland Mitigation Area Required

Wetland ID-Type	Impacted Wetland/Water	Mitigation Ratio	Required Area
Mitigation Area #1	Wetland #2, 3, 8, 14, 24	Varies	0.40 acre/17,424 ft ²
Mitigation Area #2	Wetland #38, 39, 40	Varies	0.20 acres/8,712 ft ²
Mitigation Area #3	Wetland #8, 14	Varies	0.17 acres/7,405 ft ²
WETLAND TOTAL		Varies	0.77 acres/33,541 ft ²
Riparian Plantings	Un-named Tributary to the Delaware	1.1:1	0.081 acres/3,529 ft ²
WATER TOTAL	801 ft Jurisdictional/384 ft Non-Jurisdictional	1.1:1	1,640 ft Riparian Plantings

Soil Conditions

The areas selected for mitigation are underlain by Red Hook soil. The Red Hook soil series is characterized as Somewhat Poorly Drained due to a shallow depth to a seasonal high water table. The soils were evaluated by a Certified Professional Soil Scientist and Soil Classifier on March 13, 2018. Four test pits were advanced in each mitigation area to characterize the soils and hydrology of the site. There are distinct and prominent redoximorphic features in all soil profiles for both mitigation areas; this is forming above hydraulically restrictive soil horizon. Seepage was present in the soils for Mitigation Area #1, but not present at Mitigation Area #2. Aquic conditions are present in all subsoils; with proper grading, a hydric soil will form. Included in this Narrative are the soil profile descriptions.

Hydrologic Conditions

As the proposed mitigation areas are along/contiguous to an existing PEM wetland system or located along the unnamed tributary to the Delaware River, the sites should receive ample stormwater runoff. Sources of hydrology for the mitigation site include mainly stormwater runoff from the proposed driveways as well as flow from the adjacent wetlands and Waters. The mitigation areas will be adjacent to these wetlands and Waters. The average yearly precipitation for Northampton County is 45.4 inches, which is substantially higher than the potential rate of evapotranspiration.

In terms of understanding the hydrology of the mitigation areas, the following soils information is provided:

Table S4.C4. Hydrologic Conditions for Mitigation Areas

Wetland ID-Type	Shallowest Depth to Redoximorphic Features (in)	Shallowest Depth to Water (in)	Proposed Grading Cut (in)
Mitigation Area #1	14	21	24
Mitigation Area #2	14	---	24
Mitigation Area #3	11	6	

Based on the proposed depths of grading, the bottom of the mitigation areas will be within soils that already exhibit saturated conditions (redoximorphic features) and just above the depth to a hydraulically restrictive soil horizon. From a hydrologic standpoint, these mitigation areas will not readily drain and given the inputs from both stormwater runoff and the adjacent wetland areas, these soils will have adequate hydrology to form a wetland. Additionally, in the Appendix, there is a Cross-Section figure that further illustrates the soil conditions and grading as it relates to the mitigation areas.

Grading and Topography

The mitigation design proposes to utilize a minimal amount of grading within the created wetland area. The design proposes to excavate approximately 24-inches of soil adjacent to both mitigation areas, stockpile, and replace with 6 inches of topsoil. The final grading will be an 18-inch cut and have 6 inches of topsoil overlying aquic soil conditions; water that enters the mitigation areas will not readily drain. The construction of the driveways will have steep slope embankments that will provide additional stormwater runoff into the mitigation areas. Additionally, there will be 'rough' grading within the mitigation areas, creating microtopography that will facilitate wildlife habitat.

Additionally, there will be some woody debris from brush hogging activities (up to 8-10" dbh) that will be placed in the mitigation areas. This woody debris will serve to enhance the wildlife habitat potential of the mitigation areas.

Vegetation

The wetland mitigation areas will have two separate seed mixes. The three mitigation areas should be consistently wet and will be seeded with Ernst ERNMX-120 Wetland and Food Cover Seed Mix and Ernst ERNMX-131 Obligate Wetland Seed Mix in the low-lying areas. In the higher elevations of the mitigation areas, the seed mix will be Ernst ERNMX-122 Fac-Wet Wetland Seed Mix. The seeding rate for both mitigation areas will be 20 lbs/acre.

Riparian Buffers

The riparian buffer plantings will consist of trees that are adapted to the existing soil conditions along the unnamed tributaries to the Delaware River. This will occur along Waters 8.

The existing conditions of proposed riparian buffer are at the edge of the agricultural field and consist of annual weeds (e.g. goldenrod) and invasive brush (e.g. common privet and multiflora rose). The function of the riparian buffer is to prevent pollutants from entering a stream from runoff, control erosion, and provide habitat and reduce nutrient inputs into the stream.

The riparian buffer would involve the removal of invasive weeds and shrubs and the plantings and the planting container-size trees (larger than bare root stock) at a density of 250 trees per acre. Plant selection will be completed in accordance with the guidance provided in the PADEP Riparian Buffer Guidance (2010). The plantings may include the following species:

- River birch
- Red maple
- Box elder
- Pin oak
- Slippery elm
- Sycamore

The riparian buffer will result in a 50-ft buffer along the headwaters of this stream, preventing pollutants from entering the stream and mitigating the impacts from this project.

Maintenance Plan

General maintenance activities may be necessary to ensure successful ecological function is achieved. General maintenance activities may include but are not limited to removal of exotic and nuisance species. The created wetland will also be subjected to evaluations to ensure hydric soils, hydrophytic vegetation and hydrology are being achieved to meet the definition of a jurisdictional wetland in accordance with the 1987 wetland delineation manual and the Piedmont and Eastern Mountain Regional Supplement.

The property owner/developer will be responsible for constructing and maintaining the wetland mitigation project. They will also be responsible for monitoring and protecting the mitigation site subsequent to construction completion. An as-built survey will be performed once construction of the wetland is completed. The as-built survey will record the topography and limits of the proposed mitigation area.

Signage and no-mow rocks surround the mitigation area should be implemented to prevent site landscapers or other parties from encroaching into mitigation area(s).

The area will be monitored twice/year in Years 1-3 and annually in Years 4 and 5. The results of this monitoring will determine the level of maintenance with regards to invasive species removal and/or re-seeding of the wetland areas.

The area will also be monitored twice/year in Years 1-3 and annually in Years 4 and 5. Maintenance activities for this area will include invasive species monitoring and removal and mowing if grass is present.

For the riparian buffers, the use of tree shelters and stakes will help prevent damage to trees by rodents, deer, herbicides, and mowers or weed-whackers. Tree shelters will be inspected to ensure that they are upright, straight, and that the bottom edge is pressed one inch into the ground to prevent rodent entry. Check stakes for cracks, curves, and rot. The tree diameters should be removed when the trees measure 1.5 to 2.5 inches in diameter at top of shelter.

Mowing will be utilized to manage weeds and invasive species for the first 2-3 years. Mowing suppresses the growth of vegetation around the saplings, freeing up sunlight, water, and nutrients for the saplings to use. To allow for spontaneous growth of native trees from seeds stored in the seedbank and dropped by birds, reduce mowing frequency once planted saplings reach a height of 15 feet and begin canopy closure. Continue woody invasive removal once mowing is reduced. While chemical control is not prescribed as required maintenance, it may be needed to manage weeds and invasive species.

Replanting due to seedling failure (Years 2-3) will occur if tree survival rate falls below 70% or density falls below 250 trees/acre. Replanting can occur in either fall (using containerized seedlings) or spring (using containerized seedlings or bare root stock).

S4.D – Monitoring Plans

Within 6 months of creation, the mitigation area will need to be delineated as a jurisdictional wetland. This means the site will be evaluated to determine that hydric soils, hydrology and hydrophytic vegetation are present and functioning as a jurisdictional wetland.

The approved mitigation plan must meet objective and verifiable standards during the establishment and monitoring period and over the long-term. The constructed wetland will have a unique hydrology that should contribute to a plant species composition that is consistent with the plant communities proposed for this area.

At the conclusion of 5 years, the following cover and vegetation measurements will be used to determine the ecological performance standards of the constructed wetlands:

- 100% absolute cover of bare ground
- 95% Percent cover of native, non-invasive species (NNI)
- < 5% Percent cover by non-native, invasive species (I)
- Plant species richness with consistency of the plant mix diversity.

For each individual year, the following performance standards will be met, as shown in the table below:

Table S4.D-1. Performance Standards for Mitigation Areas Years 1-5

Year	Absolute Percent Cover	Percent Cover Native Non-Invasive Species	Percent Cover Non-Native Invasive Species
1	80	≥ 75	< 10
2	85	≥ 80	< 10
3	90	≥ 85	< 5
4	95	≥ 90	< 5
5	100	≥ 95	< 5

These measurements will occur over the 5-year monitoring period. As is the case with any newly established wetland, the performance standards should consider the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management.

For the riparian buffers, performance standards will consist of the following criteria:

Table S4.D-2. Performance Standards for Riparian Buffer Area Years 1-5

Year	Tree Survival Rate	Percent Cover Non-Native Invasive Species
1	95	< 10
2	90	< 10
3	85	< 5
4	80	< 5
5	75	< 5

The wetland mitigation area is required to be monitored for a period of five years. The monitoring shall include periodic inspections by a qualified wetland scientist, specifically twice/ year for Years 1-3 and annually for Years 4-5. The inspections shall occur during the growing season. Within the following years, monitoring reports will be filed annually.

A multi-year plan has been developed for the monitoring and documentation of the created wetlands. A wetland scientist will conduct the implementation and documentation of the monitoring.

Monitoring Periods

Monitoring of the mitigation areas will be conducted semi semi-annually (spring and fall) for a period of five years.

Monitoring Field Procedures

The monitoring plan field procedures have been developed to survey the mitigated wetlands. The survey will document the following parameters:

- Surface water depths
- Vegetation coverage
- Listing of invader species and removal efforts
- Wildlife observed in wetland
- Photographs of the site

Depth of Water Surface and Hydrology

The water surface depth must be determined. In most cases the elevations will be consistent, however, a check is strongly recommended. These depths will be recorded on the field data sheets.

Vegetation Coverage and Composition

During the monitoring periods, a percent cover for each planted species will be generated. In the event of poor coverage, the representative plant species will be obtained from nursery stock or donor stock and will be replanted. If exotic and/or invasive species are observed, it will be noted in the monitoring report and they will be promptly removed from the mitigation areas.

Wildlife Observed in Wetland

Observations of macroinvertebrates, waterfowl, fish, and other associated wildlife are to be made during the survey. An informal listing and approximate numbers of the animals seen are to be included in the survey. Any evidence of the presence of animals that was seen in the field, such as tracks, dens, scratchings, etc. will be noted. A survey of macroinvertebrates will not be performed during dry periods, when surface water is not present.

Photographs of the Site

As the monitoring is being conducted, photographs are to be taken of the wetlands to document the growth and development. These photographs are to be included with the survey. The location, time, and date the picture was taken must be written on each photograph. These photos will be compiled and included with the reports.

Reporting

Reports will be submitted semi-annually for five years. All of the information, which was collected during surveys, must be included in the field data sheets for that monitoring period. Copies of the report will be provided to the PADEP, U.S. Fish & Wildlife Service and the Corps. In addition to the monitoring inspection memorandum completed at the end of Year 5, a monitoring closeout report will be completed for review by the permitting agencies.

The mitigation areas will be managed in perpetuity through a Conservation Easement. Maintenance will include any and all activities necessary to improve and sustain the ecological function of the site. Such may include but are not limited to application of mechanical and chemical means to control and eliminate exotic and nuisance species.

For the riparian buffers, after a period of five years the trees should stand roughly 10-15 feet tall (size will vary based on species); the canopy will likely not yet be fully closed. Any mortality should be evenly distributed and not exceed 20-25%. It is important to backfill any patches of significant mortality with new plantings, as consistent shade discourages invasive growth. Inspections will focus on identifications of invasive species so that they do not become prolific.

It is anticipated that long-term management will consist of quarterly site visits by on-site staff designated by the site owner to ensure that the mitigation areas are functioning as designed. A wetland scientist will complete annual site visits to verify the condition of the mitigation areas and report to the project owner if any changes are needed. It is anticipated that these annual long-term costs will be \$6,000/year. In consideration of long-term management of the mitigation and riparian areas, this amount will be included in the operating budget for this facility. For the purposes of ensuring long-term maintenance, the amount of \$150,000, or 25 years of maintenance, will be set aside for this location and kept in escrow with Upper Mount Bethel Township.

At the outset of the project, adaptive management techniques will be utilized. As surprises often arise, the wetland scientist that designed the mitigation plan will be both on-site during mitigation construction and on-call throughout the construction phase.

If, during the course of monitoring, it is evident that the mitigated wetland is not meeting its performance standards as anticipated, both the USACOE and PADEP will be notified immediately. The district engineer will evaluate and pursue measures to address deficiencies in the compensatory mitigation project.

It is possible that performance standards may be revised to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project.