Appendix A – Environmental Survey Reports



DEPARTMENT OF VETERANS AFFAIRS CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE WASHINGTON DC

August 5, 2021

U.S. Fish & Wildlife Service Attn: Ms. Jennifer Kagel Pennsylvania Field Office 110 Radnor Rd., Suite 101 State College, PA 16801

Re: Phase 1 Bog Turtle Habitat Survey Report (October 2020)

Phase 2 Presence/Probable Absence Bog Turtle Survey Report (June 2021) and Phase 1 Additional Project Area Bog Turtle Habitat Survey Report (July 2021)

Indiantown Gap National Cemetery Phase 5 Expansion Project

PNDI # 737860

Dear Ms. Kagel,

The U.S. Department of Veterans Affairs (VA), National Cemetery Administration (NCA) is currently preparing a Supplemental Environmental Assessment (SEA) in accordance with VA policy for compliance with the National Environmental Policy Act (NEPA). The SEA evaluates the potential impacts of the proposed Phase 5 expansion within the Indiantown Gap National Cemetery (IGNC). The proposed Phase 5 expansion area covers approximately 45 acres and is located east of the existing developed portion of the cemetery.

The IGNC is located in Annville, Lebanon County with approximate coordinates of 40.423871, -76.558388. Indiantown Gap National Cemetery is approximately 20-miles northeast of Harrisburg, in the Lebanon Valley of central-southern Pennsylvania.

Project Purpose

The purpose of the Phase 5 expansion is to extend the longevity of the Indiantown Gap National Cemetery and provide future generations of eligible Veterans and their families with long-term, reasonable access to burial benefits at a National Cemetery in the east central Pennsylvania region.

Surveys Completed To-Date

In 2020, VA began designing the alignment for the proposed 45-acre Phase 5 expansion area within a larger 120-acre area. Accordingly, VA performed a bog turtle habitat survey throughout this 120-acre area (120-Acre Project Area). The survey identified potential bog turtle habitat (PBTH). Subsequently, a Phase 2 Presence/Absence Survey (Phase 2) was completed and determined that no bog turtles were present within the 120-acre Project Area. No bog turtles were identified in the PBTH. The Phase 1 Bog Turtle Habitat Assessment (Phase 1) and Phase 2 Presence/Absence Survey (Phase 2) reports are included as Attachments 1 and 2, respectively, to this letter.

Subsequently, VA selected a design in early 2021. By July 2021, the design team proposed other minor surficial improvements (e.g. repaving) within the existing developed western portion of IGNC. Accordingly, a PBTH survey was performed in the western portion of the developed cemetery; the area of this survey is identified as the "Additional Project Area" in the attached report dated July 2021 (attachment 3). The survey determined that the Additional Project Area contained PBTH within 300 feet of where proposed improvements would occur. The proposed disturbance to areas within 300-feet of the identified PBTH would be limited to widening of existing paved walkways within the mowed and maintained cemetery grounds, installation of informational signage along existing roadways, and non-structural cosmetic maintenance of existing monuments and bridge structures. Additionally, VA notes there are no proposed direct impacts to wetlands or watercourses in the Additional Project Area.

However, due to the presence of PBTH, VA has elected to assume presence of bog turtles in these additional wetlands for the purposes of this Proposed Action and to employ avoidance measures during improvements to grounds located within 300 feet of the PBTH to ensure no adverse effects to bog turtles. These avoidance measures, for which we request USFWS concurrence, are as follows:

- To avoid adverse effects to bog turtles, all disturbance within 300-feet of the PBTH identified in the Additional Project Area on June 10, 2021, would be conducted during the bog turtle time-of year restriction period between October 01 and March 31, OR conducted under the supervision of a Recognized Qualified Bog Turtle Surveyor.
- Due to the currently mowed and maintained conditions adjacent to the PBTH wetlands and the limited disturbance required to complete the work proposed for the Additional Project Area, we find that installing bog turtle habitat exclusion fencing would result in additional unnecessary disturbance and extend the duration of work time needed to complete the maintenance and upgrades in the areas adjacent to the PBTH. As such, we request USFWS's additional concurrence with the recommendation of TES&P's Recognized Qualified Bog Turtle Surveyor that habitat exclusion measures should not be required if the work is conducted under the supervision of a Recognized Qualified Bog Turtle Surveyor. If additional unanticipated changes to the proposed improvements are encountered, the use of habitat exclusion measures would be utilized at the digression of the onsite Recognized Qualified Bog Turtle Surveyor and would be reported to the USFWS immediately.

A summary of the attached reports detailing and supporting the above findings is as follows:

- 1) Indiantown Gap National Cemetery Expansion Project Phase 1 Bog Turtle Habitat Survey Report (October 2020). Potential bog turtle habitat identified in wetland INC-W-002; Phase 2 Survey initiated.
- 2) Indiantown Gap National Cemetery Phase 5 Expansion Project, Phase 2 Bog Turtle Presence/Probable Absence Survey Report (June 2021). Phase 2 survey completed for wetland INC-W-002 and probable absence of bog turtles is assumed.
- 3) IGNC Phase 5 Expansion Project-Additional Project Area Phase 1 Bog Turtle Habitat Survey (July 2021). Habitat identified; wetland will be assumed to be occupied and approval of avoidance measures is requested.

Additionally, a signed copy of the final PNDI receipt #737860 is provided as an attachment following the attached survey reports.

VA is requesting your review of the attached bog turtle reports and concurrence with the avoidance measures described above and supported by the findings presented in the survey reports attached.

VA appreciates your time and attention to this request. Should you have any questions or concerns, please contact me at (202) 632-5529 or via email at Fernando.Fernandez@va.gov.

Sincerely,

FERNANDO L.

Digitally signed by

FERNANDEZ

FERNANDO L. FERNANDEZ 336237

Date: 2021.08.12 10:21:05

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Fernando Fernández, REM Environmental Engineer U.S. Department of Veterans Affairs Construction and Facilities Management Office

CC: Emma Fernandes, Mabbett & Associates, Inc. Bridger Thompson, Thompson Environmental Surveys & Permitting, LLC

Attachments:

- 1) Indiantown Gap National Cemetery Expansion Project Phase 1 Bog Turtle Habitat Survey Report (October 2020)
- 2) Indiantown Gap National Cemetery Phase 5 Expansion Project, Phase 2 Bog Turtle Presence/Probable Absence Survey Report (June 2021)
- 3) IGNC Phase 5 Expansion Project-Additional Project Area Phase 1 Bog Turtle Habitat Survey (July 2021)
- 4) PNDI # 737860

ATTACHMENT 1

Phase 1 Bog Turtle Habitat Survey Report

U.S. Department of Veterans Affairs

Proposed Phase 5 Cemetery Expansion at the Indiantown Gap National Cemetery Annville, Lebanon County, Pennsylvania

Phase 1 Bog Turtle Habitat Survey Report



Prepared for:

AE Works, Ltd.

Prepared by:

Mabbett & Associates, Inc.

Thompson Environmental Surveys & Permitting, LLC.

October 2020

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1 Introduction

Mabbett & Associates, Inc. (Mabbett) and subcontractor Thompson Environmental Surveys & Permitting, LLC. (TES&P) recently conducted a Phase 1 Bog Turtle (*Glyptemys muhlenbergii*) Habitat Survey (Phase 1) at the Indiantown Gap National Cemetery for the proposed Phase 5 expansion (hereafter referred to as the Project). The Phase 1 survey was conducted to determine if the conditions of potential bog turtle habitat (PBTH) are present within the vicinity of the Project area. The information derived from this survey will be used for future project planning and design purposes. This report documents the methodology and results of the Phase 1 Bog Turtle Habitat Survey performed for the Project by TES&P in October, 2020.

2 Background

The Project is located within the United States Geological Survey (USGS) Indiantown Gap, PA 7.5-minute series topographical quadrangle (USGS, 2013). Land cover within the Project area consists of mowed maintained open areas, forest, wetlands, watercourses, and floodplain/riparian areas. Land uses in the vicinity of the Project consist of developed military training ranges and facilities, cemetery, transmission line right-of-way, and primary and secondary roadways. The Project area drains to north and east Aires Run which is located in Swatara Creek Watershed and the Lower Susquehanna River basin.

Federal law, specifically the Endangered Species Act (ESA) of 1973, mandates that all federal agencies undertaking projects that have an effect or have the potential to have an effect on threatened, endangered, or candidate species, be it through direct or indirect jurisdiction, such as a federal license or permit, must undergo Section 7 ESA Review. The Section 7 consultation process requires that federal agencies, or those entities seeking a federal license or permit, consider how their undertakings may affect endangered species and allow the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS), if applicable, the opportunity to comment on such undertakings. Additionally, any projects in Pennsylvania that are within the known range of bog turtles, a state threatened species, and may require a Pennsylvania Department of Environmental Protection (PADEP) Chapter 105 Individual Permit, or a General Permit (GP) 5, 6, 7, 8, 9 or 11, must comply with the bog turtle screening requirements of the PA State Programmatic General Permit (PASPGP), and are required to conduct a Phase 1 Bog Turtle Habitat Survey as part of the permit review process. The known range of the bog turtle in Pennsylvania includes: Adams, Berks, Bucks, Carbon, Chester, portions of Cumberland (Yellow Breeches Watershed), Delaware, portions of Dauphin (Conewago, and Spring Creek Watershed), Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill (Swatara Creek Watershed), and York Counties (USFWS 2018; USACE, 2008).

The Project is within the known range of bog turtles in Pennsylvania. As such, a Phase 1 Bog Turtle Habitat Survey is required for any potential developments in or adjacent to the Project area.

3 Phase 1 Survey Methodology

On October 07 and 08, 2020, TES&P biologist, Bridger Thompson, a USFWS and Pennsylvania Fish and Boat Commission (PFBC) Recognized Qualified Bog Turtle Surveyor (RQBTS) conducted a Phase 1 survey for the above referenced Project to identify PBTH. PBTH is recognized by three criteria: suitable hydrology (including spring seeps, shallow surface water, persistently saturated soils, subsurface flow, and rivulets); suitable soils (including a bottom substrate of soft muck, a critical criterion) and; suitable vegetative structure (including dominant vegetation of low grasses and sedges, reed canary grass, cattail, rice cut grass, phragmites, or skunk cabbage, and possibly a scrub-shrub wetland component with a relatively open canopy).

Based on information provided by AE Works, Ltd., the Phase 1 Study Area (Study Area) was determined. The Study Area includes all wetlands identified within 300 feet of the proposed Project limits-of-disturbance. The approximately 216-acre Study Area is located adjacent to the Indiantown Gap National Cemetery, south of Biddle Drive and west of Indiantown Road in East Hanover and Union Townships, Lebanon County, Pennsylvania (**Figure 1 - Project Location Map**). Prior to conducting the onsite survey, TES&P conducted a desktop review for the Project and investigated current and historic aerial imagery of the Study Area. An aquatic resources delineation survey was conducted concurrently with the Phase 1 survey. During the onsite surveys TES&P identified eighteen (18) wetlands within the Study Area. Each resource was assessed in its entirety for the conditions required to be considered PBTH. If a wetland was determined to be PBTH, the Designated Survey Area (DSA) within the wetland was determined. DSA is defined as all areas of the wetland where soft muck-like soils are present. Information recorded during the Phase 1 survey for each wetland is presented on the USFWS Phase 1 Bog Turtle Habitat Survey Field Forms for the Northern Population Range (Revised April 2020), including dominant plant species, substrate characteristics, and hydrology (Attachment B). Representative habitat conditions within the wetlands were photographed and are included in the attached photo log (Attachment C).

4 Habitat Survey Results

During the on-site survey, TES&P investigated eighteen wetlands identified within the Study Area. The following is a brief description of the investigated resources and their potential to be considered bog turtle habitat.

Wetland (INC-W-001)

Wetland INC-W-001 is an approximately 0.14-acre palustrine emergent (PEM) wetland located in a topographic depression at the edge of the existing mowed maintained cemetery boundary. The wetland is situated at the discharge of a small seasonal ground water seep that is the origin of a downslope perennial channel. The primary source of hydrology to the wetland is the seasonal groundwater discharge and seasonally high ground water table. Surface water runoff from adjacent uplands also contributes to the wetland hydrology. The wetland vegetation is dominated Japanese stilt grass (*Microstegium vimineum*), clearweed (*Pilea pumila*), and fowl managrass (*Glyceria striata*). The substrate of the wetland contains silt loam underlain by clay loam material and was not mucky. The wetland is not dominated by species common to areas identified as PBTH and, it does not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition lacking an appropriate habitat structure wetland INC-W-001 is not considered PBTH. The location of the wetland is depicted on Page 5 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-002)

Wetland INC-W-002 is an approximately 0.52-acre PEM wetland located in a topographic depression at the toe of the fill slope of Biddle Drive. The wetland is situated at the discharge of multiple seasonal ground water seeps that contribute to a downslope perennial channel. The primary source of hydrology to the wetland is the persistent groundwater discharge, seasonal high ground water table, and a surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese stilt grass, dark green bulrush (*Scirups atrovirens*), and cattail (*Typha latifolia*). The substrate of the wetland contained silt and silt loam underlain by clay loam and contained areas of mucky substrate measuring to depths of 3-to-10 inches associated with the persistent groundwater fed hydrology. The wetland contains species common to areas identified as PBTH and areas with the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. While portions of the wetland have been historically disturbed by road construction enough microhabitat conditions and vegetative structure remain to potentially support bog turtles. **Due to the presence of persistently ground water fed hydrology and mucky soil substrate and the presence of a vegetative structure containing microhabitat conditions wetland INC-W-002 is considered PBTH. Approximately 0.12-acres of DSA was identified within the wetland. The location of the wetland and associated DSA is depicted on Page 1 of Figure 2, additional wetland information is provided in Table 2.**

Wetland (INC-W-003)

Wetland INC-W-003 is an approximately 0.01-acre PEM wetland located along the floodplain of a small intermittent watercourse that flows through a natural swale on a wooded hillslope. The primary source of hydrology to the wetland is the seasonal ground water flow within the watercourse and surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese stilt grass, bulrush, and jewelweed (*Impatiens capensis*). The substrate of the wetland was saturated and contained silt loam but, was not mucky per association with persistent spring fed hydrology. The wetland did contain species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by logging. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-003 is not considered PBTH. The location of the wetland is depicted on Page 3 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-004)

Wetland INC-W-004 is an approximately 0.02-acre PEM wetland located at the origin of a small intermittent watercourse that flows through a natural swale on a wooded hillslope. The primary source of hydrology to the wetland is the seasonal ground water discharge within the wetland and surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese stilt grass, jewelweed, and sensitive fern (*Onoclea sensibilis*). The substrate of the wetland was not saturated and contained silt loam that was not mucky per association with persistent spring fed hydrology. The wetland did contain some species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by logging. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-004 is not considered PBTH. The location of the wetland is depicted on Page 1 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-005)

Wetland INC-W-005 is an approximately 0.01-acre PEM resource located in the central portion of the Study Area. The wetland is situated in a topographic depression within a periodically maintained transmission right-of-way area adjacent to a wooded/shrubby hillslope. The primary source of wetland hydrology is provided by a seasonal groundwater discharge and surface water runoff collection within the right-of-way. The wetland vegetation is dominated by Japanese stiltgrass, sensitive fern, and ironweed (*Vernonia altissima*). The substrate of the wetland was not saturated and contained silt loam underlain by a clay loam that was not mucky per

association with persistent spring fed hydrology. The wetland did contain some species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by right-of-way clearing and maintenance. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-006 is not considered PBTH. The location of the wetland is depicted on Page 1 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-006)

Wetland INC-W-006 is an approximately 0.04-acre PEM wetland located at the origin of a small intermittent watercourse that flows through a natural swale on a wooded hillslope. The primary source of hydrology to the wetland is the seasonal ground water discharge within the wetland and surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese stilt grass, jewelweed, and arrowleaf tearthumb (Persicaria sagittata). The substrate of the wetland was saturated and contained silt loam underlain by a clay loam but, the substrate was not mucky per association with persistent spring fed hydrology. The wetland did contain some species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by logging. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-006 is not considered PBTH. The location of the wetland is depicted on Page 2 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-007)

Wetland INC-W-007 is an approximately 0.10-acre PEM resource located in the southeast portion of the Study Area. This wetland is associated with the seasonal groundwater discharge from several intermittent channels that are loosely defined throughout a forested bottomland. The surrounding area contains thick scrub-shrub vegetation resulting from historic use of the area for military training activities and recent logging. The wetland vegetation is dominated by Japanese stilt grass, jewelweed, sensitive fern, and bulrush and the surrounding forested area contains ash species (Fraxinus sp.), red maple (Acer rubrum), and spice bush (Lindera benzoin). The wetland contains some vegetation commonly observed in PBTH however, there is no mucky soil substrate. Due to the historic disturbances, lack of a mucky soil substrate, spring fed hydrology, and appropriate microhabitat conditions, wetland INC-W-007 is not considered PBTH. The location of the wetland is depicted on Page 8 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-008)

Wetland INC-W-008 is an approximately 0.08-acre PEM resource located in the southwest portion of the Study Area. The wetland is located natural depressional topography within a drainage in a wooded shrubby lot. The wetland hydrology is associated with seasonal ground water discharge, seasonally high groundwater, and surface water runoff from upslope-maintained cemetery grounds. The wetland vegetation is dominated by arrowleaf tearthumb, jewelweed, Japanese stiltgrass, sensitive fern, and bulrush. The wetland substrate soft due to the persistently saturated conditions however, it is not mucky. The vegetative structure is not consistent with the conditions typically observed in PBTH and no subsurface flow or microhabitat conditions were observed. Due to the lack of a spring fed hydrology, mucky soil substrate, and appropriate vegetative and micro-habitat conditions, wetland INC-W-008 is not considered potential bog turtle habitat. The location of the wetland is depicted on Page 7 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-009)

Wetland INC-W-009 is an approximately 0.04-acre PEM resource located in the southwest portion of the Study Area. The wetland is located in an excavated swale that receives stormwater discharge form the upslopemaintained cemetery grounds. The wetland hydrology is associated with seasonal groundwater discharge, seasonally high groundwater table and surface water runoff that collects constructed swale. The wetland

vegetation is dominated by Japanese stiltgrass, cattail, bulrush, and willowherb (*Epilobium ciliatum*). The wetland substrate is saturated however, it is not mucky and the vegetative structure was not consistent with the conditions typically observed in PBTH. Due to disturbed wetland conditions and the lack of a spring fed hydrology, mucky soil substrate, and appropriate vegetative and micro-habitat conditions, wetland INC-W-009 is not considered potential bog turtle habitat. The location of the wetland is depicted on Page 7 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-010)

Wetland INC-W-010 is an approximately 0.01-acre PEM wetland located along the discharge of a small ephemeral watercourse flows through natural low topography on a wooded hillslope. The primary source of hydrology to the wetland is the surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese stilt grass, jewelweed, willowherb, beggars tick (*Bidens frondosa*). The substrate of the wetland is not saturated and contained silt loam underlain by a clay loam that was not mucky per association with persistent spring fed hydrology. The wetland did contain some species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by logging. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-010 is not considered PBTH. The location of the wetland is depicted on Page 5 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-011)

Wetland INC-W-011 is an approximately 0.02-acre PEM resource located in the central portion of the Study Area. The wetland is located in depressional topography downslope of a graded filled storage site. The primary source of wetland hydrology is the surface water runoff collection from the surrounding uplands and disturbed fill areas. The wetland is only vegetated on its fringes and could be more precisely classified as a vernal pool as it has evidence of an algal mat in the central non-vegetated concave areas. The fringe vegetation is dominated by Japanese stiltgrass, bulrush, and Pennsylvania smartweed (*Polygonum pensylvanicum*). The wetland substrate was not saturated and was primarily composed of silt deposited from erosion. The vegetative structure in the wetland was not consistent with the conditions typically observed in potential bog turtle habitat. Due to the lack of a mucky soil substrate, spring fed hydrology, and appropriate vegetative and micro-habitat conditions, wetland INC-W-011 is not considered PBTH. The location of the wetland is depicted on Page 5 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-012)

Wetland INC-W-012 is an approximately 0.20-acre PEM wetland located in a wooded shrubby lot at the edge of a mowed maintained cemetery boundary. The wetland is situated at the discharge of several small seasonal ground water seeps that create a heavily incised downslope intermittent channel. The primary source of hydrology to the wetland is the seasonal groundwater discharge and seasonal high ground water. Surface water runoff from adjacent uplands also contributes to the wetland hydrology. The wetland vegetation is dominated Japanese stilt grass and jewelweed. The substrate of the wetland was saturated and contains silt loam underlain by clay loams material that was not mucky. The wetland is not dominated by species common to areas identified as PBTH and, it does not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition lacking an appropriate habitat structure wetland INC-W-012 is not considered PBTH. The location of the wetland is depicted on Page 5 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-013)

Wetland INC-W-013 is an approximately 0.01-acre PEM wetland located at the origin of a small ephemeral watercourse flows through a natural swale on a wooded hillslope. The primary source of hydrology to the wetland is the surface water runoff from adjacent uplands. The wetland vegetation is dominated by Japanese

stilt grass, jewelweed, and sensitive fern. The substrate of the wetland was not saturated and contained silt loam underlain by a clay loam that was not mucky per association with persistent spring fed hydrology. The wetland did contain some species common to areas identified as PBTH however, it did not contain the appropriate habitat structure including surface flow in rivulets, subsurface flow, and micro habitat conditions. Additionally, the wetland is located in an area that has been historically disturbed by logging. Due to the lack of spring fed hydrology and mucky soil substrate, and the historically disturbed condition of surrounding area wetland INC-W-013 is not considered PBTH. The location of the wetland is depicted on Page 5 of Figure 2, additional wetland information is provided in Table 2.

Wetland (INC-W-014)

Wetland INC-W-014 is an approximately 0.02-acre PEM resource located in the northwest portion of the Study Area. This wetland is situated along the interface of a toe of slope and the floodplain of a small perennial watercourse. The wetland vegetation is dominated by Japanese stiltgrass, and spicebush (*Lindera benzoin*). The primary source of wetland hydrology is seasonal groundwater discharge at the toe of slope and surface water runoff collection from periodic flood flow. The wetland substrate was saturated and consists of a is a silt loam and sandy alluvial deposits. The wetland does not contain a mucky soil substrate or spring fed hydrology. The vegetative structure and micro habitat conditions are not consistent with the conditions typically associated with PBTH. Due to the lack of a spring fed hydrology and mucky soil substrate wetland INC-W-014 is not considered PBTH. The location of the wetland is depicted on Page 1 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-015)

Wetland INC-W-015 is an approximately 0.04-acre PEM resource located north-central portion of the Study Area. This wetland is situated along the interface of a toe of slope and the floodplain of a small intermittent watercourse within a disturbed transmission line right-of-way. The wetland vegetation is dominated by Japanese stiltgrass and cattail. The primary source of wetland hydrology is seasonal groundwater discharge at the toe of slope and surface water runoff collection from periodic flood flow. The wetland substrate is saturated and consists of a silt loam and sandy alluvial deposits. The wetland does not contain a mucky soil substrate or spring fed hydrology. The vegetative structure and micro habitat conditions are not consistent with the conditions typically associated with PBTH. Due to the lack of a spring fed hydrology and mucky soil substrate wetland INC-W-015 is not considered PBTH. The location of the wetland is depicted on Page 3 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-016)

Wetland INC-W-016 is an approximately 0.14-acre PEM resource located in the north-central portion of the Study Area. This wetland is situated on a low-lying floodplain bench along a small perennial watercourse. The primary source of wetland hydrology is the seasonally high groundwater table and periodic flooding from the perennial channel. The wetland substate was not saturated and consists of a silt loam. The wetland vegetation is dominated by Japanese stiltgrass and spice bush. The wetland does contain the vegetative structure and micro habitat conditions typically associated with PBTH and the wetland does not contain a mucky soil substrate or persistent spring fed hydrology. Due to the lack of a spring fed hydrology, mucky soil substrate, and appropriate vegetative structure and microhabitat conditions wetland INC-W-016 is not considered PBTH. The location of the wetland is depicted on Page 3 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-017)

Wetland INC-W-017 is an approximately 0.02-acre PEM resource located northeast portion of the Study Area. The wetland is situated at the interface between a toe of slope and a floodplain bench within a disturbed transmission line right-of-way. The primary source of wetland hydrology is seasonal toe of slope ground water discharge and seasonally high groundwater table. The wetland vegetation is dominated by Japanese stilt grass, cattail, and arrow leaved tearthumb. The wetland substrate is saturated and consists of a silt loam. The substrate is soft due to the persistent saturated conditions however no deep mucky areas were observed. The wetland does

contain the vegetative structure commonly associated with PBTH. However, the micro habitat conditions in the wetland are not consistent with the conditions typically observed in PBTH. Due to the lack of a mucky soil substrate, persistent spring fed hydrology, and appropriate and micro-habitat conditions, wetland INC-W-017 is not considered PBTH. The location of the wetland is depicted on Page 3 of Figure 2. Additional wetland information is provided in Table 2.

Wetland (INC-W-018)

Wetland INC-W-018 is an approximately 0.24-acre PEM resource located in the northwest extent of the Study Area. The wetland is situated in a periodically maintained roadside ditch along Biddle Drive. The primary source of wetland hydrology is associated with seasonal groundwater discharge that collects in the ditch at the toe of the fill slope for the road. Additional hydrology is provided by stormwater discharge from roadside culverts and surface water collection in the low-lying topography. The wetland vegetation is dominated by cattail Japanese stilt grass, cattail, sensitive fern, and arrowleaf tearthumb. The wetland does not contain a persistent spring fed hydrology or mucky soil substrate, and lacks the micro habitat conditions associated with PBTH. Due to the lack of a spring fed hydrology, mucky soil substrate, and lacking vegetative structure and micro habitat conditions, and the periodic and historic disturbances wetland INC-W-018 is not considered PBTH. The location of the wetland is depicted on Page 4 of Figure 2. Additional wetland information is provided in Table 2.

Table 2- Wetland Identification Table

Resource ID	Type (PEM/PFO/PSS) ¹	Latitude	Longitude	Approximate Wetland Acreage (ac.)	Potential Bog Turtle Habitat or Travel Corridor (Y/N/UK) ²	Approx. Acreage of DSA (ac.)
INC-W-001	PEM	40.423065	-76.562842	0.14	N	N/A
INC-W-002	PEM	40.424842	-76.566119	0.52	Y	0.12
INC-W-003	PEM	40.424552	-76.565716	0.01	N	N/A
INC-W-004	PEM	40.424179	-76.565654	0.02	N	N/A
INC-W-005	PEM	40.424046	-76.565338	0.01	N	N/A
INC-W-006	PEM	40.425187	-76.560155	0.04	N	N/A
INC-W-007	PEM	40.420372	-76.557410	0.10	N	N/A
INC-W-008	PEM	40.419790	-76.561134	0.08	N	N/A
INC-W-009	PEM	40.419976	-76.561614	0.04	N	N/A
INC-W-010	PEM	40.420604	-76.559229	0.01	N	N/A
INC-W-011	PEM-Vernal	40.421766	-76.560199	0.02	N	N/A
INC-W-012	PEM	40.421950	-76.561219	0.20	N	N/A

Resource ID	Type (PEM/PFO/PSS) ¹	Latitude	Longitude	Approximate Wetland Acreage (ac.)	Potential Bog Turtle Habitat or Travel Corridor (Y / N / UK) ²	Approx. Acreage of DSA (ac.)
INC-W-013	PEM	40.423140	-76.560306	0.01	N	N/A
INC-W-014	PEM	40.425439	-76.564939	0.04	N	N/A
INC-W-015	PEM	40.425980	-76.556861	0.04	N	N/A
INC-W-016	PEM	40.426610	-76.556800	0.14	N	N/A
INC-W-017	PEM	40.426539	-76.55554	0.02	N	N/A
INC-W-018	PEM	40.424629	-76.567777	0.24	N	N/A

 $^{1.\} PEM-PALUSTRINE\ EMERGENT,\ PFO-PALUSTRINE\ FORESTED\ PSS-PALUSTRINE\ SCRUB-SHRUB,\ PUB\ PALUSTRINE\ UNCONSOLIDATED\ BOTTOM.$

5 Summary

Eighteen (18) wetlands were investigated during the Phase 1 Bog Turtle Habitat Survey performed on October 07 and 08, 2020 for Mabbett and Associates, Inc. at the Indiantown Gap National Cemetery proposed Phase 5 Expansion Project. One wetland (INC-W-002) was determined to be potential bog turtle habitat. No additional resources within the Phase 1 bog turtle habitat survey study area were determined to be potential bog turtle habitat.

This report was prepared by:

Thompson Environmental Surveys & Permitting, LLC.

Bridger J. Thompson

Senior Biologist/Owner

^{2.} Y-YES, N-NO, UK-UNKNOWN.

6 References

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Natural Resources Conservation Service (NRCS). 2015. Soil Survey Geographic (SSURGO) Database for Montgomery and Berks County, Pennsylvania. Accessed at http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm in October 2020.

U.S. Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory. United States Department of the Interior, Fish and Wildlife Service, Washington, District of Columbia. Accessed at http://www.fws.gov/wetlands/ in October 2020.

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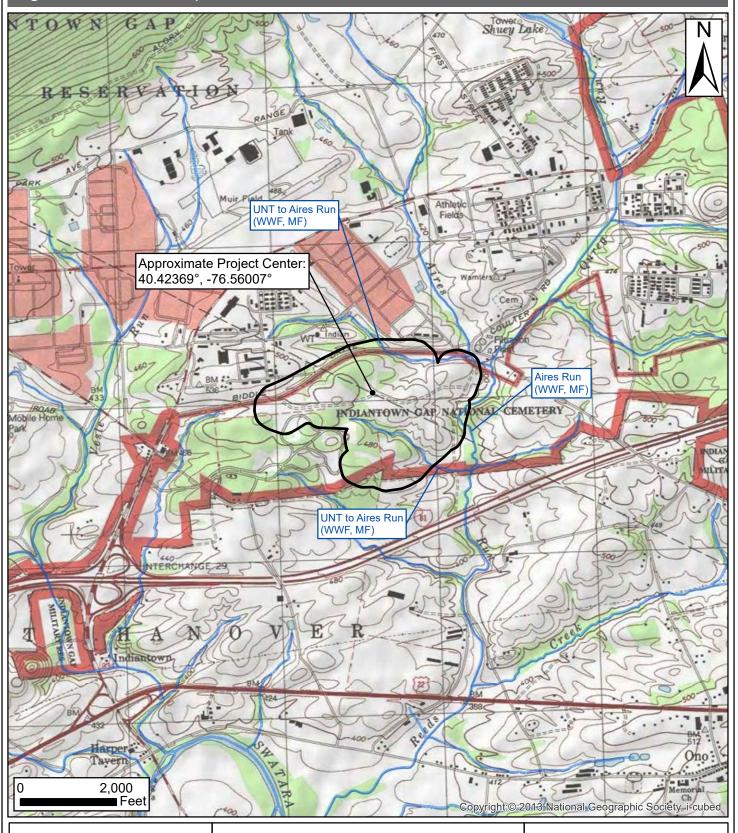
USFWS. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population Recovery Plan. Hadley, Massachusetts.

United State Geological Survey (USGS) 2013. Perkiomenville, and Milford Square, Pennsylvania 7.5-Minute Series Topographic Quadrangle Maps. Reston, Virginia.

Appendix A Figures

INDIANTOWN GAP NATIONAL CEMETERY

Figure 1: Location Map

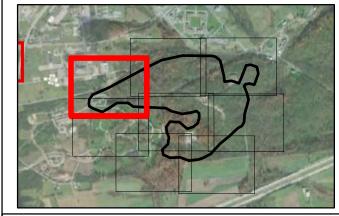




USGS 7.5' Quadrangle: Indiantown Gap
East Hanover and Union Townships
Lebanon County, Pennsylvania

Mabbett*

INC-W-005 (PEM)



Mabbett*



0 75 150 Feet Created By: CMG

Date: 10/27/2020



Mabbett*



150 — Feet

Created By: CMG

Date: 10/27/2020



Mabbett*



150 — Feet 75

Created By: CMG

Date: 10/27/2020

Appendix B

USFWS Phase 1 Bog Turtle Habitat Survey Field Forms for the Northern Population Range

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: INC- W-00/ PNDI # (for PA): 7/9/37
General Into	Property/Project Name Indiantown Gap National Cometery Expansion Project Coordinates 40.423065, -76562842 Project Type Expansion of Existing Site Entity Requesting Phase 1 Survey Mabbett & Associates, Inc. County/Township/Municipality East Hanover + Union Twp. Lebanon Co. Lead Surveyor Bridger Thompson Affiliation Thompson Environmental Other Assistants Present Emma Fernandes
Date/Condition	Date of Survey 10/07/20 Time In 0930 Time Out 1000 Air Temp. 60 Fg Co Last Precipitation < 24 hours 1-7 days ×>1 week unknown Drought conditions? Yes × No Unknown Drought Index+1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken × Yes No (Provide photo location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed): The region is experioning very dry dry drought like conditions.
Wetland Info	Wetland Size 0.14 acres, if known # Wetlands w/in Project Area²/8_ Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0% ≤ 5 6-20 ∠ 21-40 41-60 > 60 Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information Springs/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacteria Watercress X Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding⁴ Routine Flooding⁵) Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep) X Small Puddles/Depressions (/ inches deep) X Saturated soils present? If yes, year-round? X Likely Unlikely Unk Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-001
WELIAIIQ ID.	** * *

 $\underline{\times}$ Yes $\underline{\hspace{0.3cm}}$ No Are there any signs of disturbance to $\underline{vegetation}$ (e.g., mowing, pasturing, burning)? If yes, describe:

Site has been logged

fotland in

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD- Weikert channery silt loam 15 to 25 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		<u>in.</u>	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoln	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfaliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Buirush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calomus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix loricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. <i>Polygonum</i> spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Pholoris arundinocea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in Guidelines for Bog Turtle Surveys for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in Guidelines for Bog Turtle Surveys).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C 1// -0022 PNDI # (for PA): 7/9/37
	Property/Project Name Indiantown Gap National Compteny Expansion Project
	Property/Project Name Indiantown Gap National Cometery Expansion Project Coordinates 40.424842, -76.566119 Project Type Expanding Existing Factifys
<u>1</u> 0	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
2	County/Township/Municipality East Hanover & Union Tup. Lebanon Co.
General Info	Lead Surveyor Budge Thompson Affiliation Thompson Environmental
	Other Assistants Present Emma Fernandes
	Date of Survey 10/07/20
Ę	Last Precipitation < 24 hours 1-7 days \times > 1 week unknown Drought conditions? Yes \times No Unknown
Date/Condition	Drought Index*1 (Circle): none Do D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo location map)
5	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
ate/	The region is experienced very dry drought like conditions.
	Wetland Size 0,57 acres, if known #Wetlands w/in Project Area ² 18
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover*3 0% ≤5 6-20 21-40 41-60 > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	X Springs/SeepsSpringhouse X Trib/StreamPond X StormwaterIron BacteriaWatercress
	★ Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding⁴ Routine Flooding⁵)
	∠ Rivulets (inches deep) ∠ Subsurface Tunnel/RivuletsTire Ruts (inches deep)
	Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
Info	ponds, roads, beaver activity? Portions of the methand are impacted by historic
Wetland Info	road construction, withand receives stomwated discharge from road side culvert and up slope country grounds.
ž	
	Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $\times 11-20$ $\times > 20$
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	No

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-00Z	
wetiand in:	77 YC 17 PC	

Yes X No Are there any signs of disturbance to *vegetation* (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

CMB - COMIN SILT loam 3 to 8 percent slopes

How much sultable habitat is in this wetland? Estimate acreage or percentage: O112 - QCVC DSA

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%.	25%	<u>⊬ in.</u>	/0 in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:			<u>in.</u>	in.
POW/PUB Portion of Wet	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitivé Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green \$edge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicoria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: /NC-W-00Z
ſ	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	wetland is located in depressional topography at toe slape
	wetland is located in depressional topography at toe slope that is the origin of multiple intermitent chamels wetland
	abitts a tillstope for Biddle Drive.
	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? $\underline{\times}$ Yes No Unk Habitat off-site? $\underline{\times}$ Yes No Unk
	If yes, how did you conclude this? This methand is PBTH, Phase I surveys condu
	at this location be historic projects have I destitled PBTH w/10
	The watershed.
_	The graph of the second of the
	Were any bog turtles observed?Yes \(\times \) No If yes, how many? are conducting the survey in to handle bog turtle Other herps observed? \(\times \) Yes No If yes, which ones? *Report bog turtle observations to your local FV field Office and state wildlife office within 48 hr
	 ✓ Yes No Unsure ✓ This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.
	Notes (How did you reach this opinion?): The wetland is persistently spring of ground
	water derived, The wetland contains mucky substrate 4-10 in depta. The vegetative structure and micro-habital conditions are consistent up PBTH.
	IN appro. The vertetal structure and MICH-MARITHE CONDITIONS Are
	Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is
	accurate and complete.
	Print Name Bridger Thompson Signature Bright hupan
	Date 10/07/2020
	Date 70/0// 2020
	Contact Information b thompson @ Thompsonesp. com 717-409-3301

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Popul	lation Range Wetland ID: ///C-W-003
(Revised April 29, 2020) Please do not edit document.	PNDI # (for PA): 7/9/3 7
Property/Project Name Indiantum Gap National Cometery	Expansion Project
Coordinates 40.424552 , -76.545714 Project Typ	De Expanding existing Facility
Entity Requesting Phase 1 Survey Mabbett ! Associates,	Inc.
County/Township/Municipality <u>Fast Hanover</u> + Union Tup. Lead Surveyor Bridger Thompson Af	
Lead Surveyor Bridger Thompson Af	fillation Thompson Environmental
Other Assistants Present Emma Fernandes	,
Date of Survey 10/07/2020 Time In 10 45 Time Out	// Air Temp. 40 F°C°
Last Precipitation < 24 hours 1-7 days $ ot \succeq > 1$ week unknown Drou	ught conditions?Yes × NoUnknown
Drought Index*1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taker	
Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice condition	ns, and any other seasonal conditions observed):
Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taker Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice condition The region is experiencing very dry dry dry	ant like conditions.
Wetland Size OD/ acres, if known # Wetlands w/in Project Area ²	18
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1	
Estimate % Canopy Cover*3 0% ≤5 6-20 × 21-40 4:	
Hydrology and Soils (check all that apply): use additional pages to further disc	
Springs/SeepsSpringhouse \(\sum \text{Trib/StreamPondStormwat} \)	
Water Visible on Surface Evidence of Flooding Yes No If yes,	
Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Rut:	
Small Puddles/Depressions (inches deep) $ imes$ Saturated soils presen	
Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ponds, roads, beaver activity)?	e ditches, tile drainages, berms, culverts, fill material,
ponds, roads, beaver activity) r	
Estimate time period (in years) of disturbance*: ≤ 56-1011-203	> 20
For ditches that may be present, is there bog turtle habitat? If yes, describe:	:
None	
/Y 0/IC	
(*) Denotes reference to the Supplemental Information document that provides m	nore details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: _	INC-W	-003
---------------	-------	------

Yes __ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

HISTORIC LoggIng

Jotland Inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

CMB- comby Silt loam 3 to 8 percent slopes

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/4 in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wes	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phrogmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typho</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicario	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex Interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: _/NC- W-00 3
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	without is located in a natural gully who a wooded-shrubby los
	wetland is situated along a small incised intermetent
	Avainage that provides seasonal hydrology.
	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? XYes No Unk
	If yes, how did you conclude this? Phase I Survey identified PBTH w/in I wetland
	when the Project area phi surveys conducted when proximity
	of this site for historic projects have iduthed PBTH with the wa
-	*Note that you must be permitted by the state you
	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
-	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS
	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The solls criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
_	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The solls criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
	Were any bog turtles observed?YesNoIf yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?YesNoIf yes, which ones?
_	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present. Notes (How did you reach this opinion?): wetland is not persisted spring had.
	Were any bog turtles observed? Yes No If yes, how many?
	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wild life office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The solls criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persisted spread present No week substrate object within 48 hr.
	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persustably spring Red. No wegetative structure in micro-habitat. Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document.	Wetland ID: <u>///C- W- 00 4</u> PNDI # (for PA): <u>7/9/37</u>
	Property/Project Name Indiantown Gap National Cometary Expansi	on Project
	Coordinates 40.424/79, -76.545654 Project Type Espanding	
	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.	, ,
	County/Township/Municipality East Hanover + Union Two Lebano	u Co.
	Lead Surveyor Bridge Thompson Affillation Thom	ipsan Environmenta.
	Other Assistants Present Emma Fernandes	
	Date of Survey 10/07/2020 Time In 1100 Time Out 1115	_ Air Temp. <u>60</u> F°C°
	Last Precipitation < 24 hours 1-7 days \times > 1 week unknown Drought conditions?	Yes <u>×</u> NoUnknown
	Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken \(\subseteq \text{Yes} \) No (F	rovide photo location map)
1	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other sea	
in the factor of	The region is experiencinal very day drought like	conditions
	Wetland Size 0.0Z acres, if known #Wetlands w/in Project Area ² 18	
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4	5+ 10+
	Estimate % Canopy Cover*3 0% < 5 × 6-20 21-40 41-60 > 60	
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent gen	eral wetland information
	★ Springs/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacter	
	Water Visible on Surface	
	RIVIJETS (INCHES GEED) SUDSUFFACE HINNEJ/RIVIJETS HEE RUTS (INCHES GE	en)
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches de	
	Small Puddles/Depressions (inches deep) $ imes$ Saturated soils present? If yes, year-rou	nd? $ imes$ Likely Unlikely Unk
		nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \times Saturated soils present? If yes, year-rould yes \times No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainage	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \times Saturated soils present? If yes, year-rould yes \times No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainage	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \times Saturated soils present? If yes, year-rould yes \times No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainage	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \times Saturated soils present? If yes, year-rould yes \times No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainage	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \(\sum \) Saturated soils present? If yes, year-roungly Yes \(\sum \) No Are there any signs of disturbance to \(\frac{hydrology}{a} \) (e.g., drainage ditches, tile drainal ponds, roads, beaver activity)?	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) \(\sum \) Saturated soils present? If yes, year-roungly Yes \(\sum \) No Are there any signs of disturbance to \(\frac{hydrology}{a} \) (e.g., drainage ditches, tile drainal ponds, roads, beaver activity)?	nd? $ imes$ Likely Unlikely Unk
	Small Puddles/Depressions (inches deep) ∠ Saturated soils present? If yes, year-roung yes ∠ No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainal ponds, roads, beaver activity)? Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20	nd? $ imes$ Likely Unlikely Unk

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

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Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetfand Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

CMB-	comby	314	loam	3	10	8	percent stopes
------	-------	-----	------	---	----	---	----------------

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	~/4 in.	N/A in.
PSS Portion of Wetland:	- E		<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wes	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush <i>Lindera benzoin</i>	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID:
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	Withand is located in a wooded-shoubby lot adjacent to a
	transmission line Row. Wethand is associated w/ scasonal
	ground water seep that discharges in a shallow depression.
Landscape into	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
3	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of itAll of itPart of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? $\underline{\times}$ Yes No Unk Habitat off-site? $\underline{\times}$ Yes No Unk
	If yes, how did you conclude this? A Phase I survey to this Project I don't feed
	PBTH W/m the study area. Prinous Phasel surveys in the area
	have Idntified PBTH win the nutershed.
sapade	Were any bog turtles observed?Yes $\stackrel{\checkmark}{\succeq}$ Noif yes, how many? *Note that you must be permitted by the state yo are conducting the survey in to handle bog turtles Other herps observed?Yes $\stackrel{\checkmark}{\succeq}$ Noif yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
	Yes ∠NoUnsure The hydrology criterion for bog turtle habitat is metYes ∠NoUnsure The soils criterion for bog turtle habitat is metYes ∠NoUnsure The vegetation criterion for bog turtle habitat is metYes ∠NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality).
	Yes 🕍 No 🔃 Unsure This wetland HAS potential bog turtle habitat (low to very low quality).
	∠ This wetland does NOT have potential bog turtle habitat. _ UNSURE if suitable habitat is present.
	Notes (How did you reach this opinion?): Wetland is not persisterty spring ked withand does not contain mucky substructe
	withand does not contain mucky substrate
	without does not nove micro-habitat conditions
	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridger Thompson Signature Bolly -
	Print Name Bridger Thompson Signature Bright Date 10/07/2020
	Contact Information 6 thempson & thempson esp. com 717-609.3301

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///L-W-005 PNDI # (for PA): 7/9/37
	Property/Project Name Indiantown Gap National Cometery Expansion Project
	Coordinates 40.424046, -76.565338 Project Type Expending existing facility.
<u>u</u>	Entity Requesting Phase 1 Survey Mabbetl & Associates, Inc
General Info	County/Township/Municipality East Hanover + Union Tup Lebanon Co.
Gen	Lead Surveyor Bridge Thompson Affiliation Thompson Environmatal
	Other Assistants Present Emma Fernandes
	Date of Survey 10/07/2020 Time in 1/15 Time Out 1/30 Air Temp. 60 (F°)C°
5	Last Precipitation < 24 hours 1-7 days \times > 1 week unknown Drought conditions? Yes \times No Unknown
nditi	Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken X Yes _ No (Provide photo location map)
Date/Condition	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
Date	The region is experiencing very dry drought like conditions
	Wetland Size 0.01 acres, if known # Wetlands w/in Project Area ² 18
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover*3 × 0% _ ≤ 5 _ 6-20 _ 21-40 _ 41-60 _ > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	∑ Springs/Seeps _ Springhouse _ Trib/Stream _ Pond ∑ Stormwater _ Iron Bacteria _ Watercress
	Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	Small Puddles/Depressions (inches deep) XSaturated soils present? If yes, year-round? X Likely Unlikely Unk
	Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
Info	ponds, roads, beaver activity)? Wetland is win a constructed transmission like
Wetland Info	ROW.
š	
	Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $\cancel{\succeq} > 20$
	For discharge that may be present is there has turtle habitat? If you describe:
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-	W-005
wedand ib.		

×	es No	Are there a	any signs o	of dist	urbance to <u>vegetatio</u>	<u>n</u> (e.g., mowing, pastur	ring, burning)? If yes, describe	: :
	with	and 15	WIn	9	periodically	maintained	transmission In	w ROW.

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Spraying of herbicide, cotting woody veg.

Soil types present*:

CMb-COM/4 SILY loam 3 to 8 percent 6/opes

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wei	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush <i>Lindera benzoin</i>	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedg Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex Interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Docceik	Wetland ID: _//\C-W-003
	e surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
We	Hand is located in a slight depression when a periodically
m	intained transmission line ROW. Withand is assoluted w/
4	intained transmission line ROW. Without is associated w/ small seasonal ground water Aschared w/ in the Row
How m	uch of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
If part	of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
Is ther	e potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site ? Yes No Un
If yes,	now did you conclude this? Phase I survey for this Project identified
DE	the Win The Study area
PHI	guiveys to previous projects have identified PETES outer the
,,	negtershed.
	Field Office and state wildlife office within 48
Ye Ye Ye Ye	S NO Unsure The hydrology criterion for bog turtle habitat is met. The soils criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality).
Ye Ye Ye Ye	The hydrology criterion for bog turtle habitat is met. The soils criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present.
YeYeYeYeYe X_Th	S NO Unsure The hydrology criterion for bog turtle habitat is met. The soils criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality).
YeYeYeYeYh	No Unsure The hydrology criterion for bog turtle habitat is met. No Unsure The soils criterion for bog turtle habitat is met. No Unsure The vegetation criterion for bog turtle habitat is met. No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Is wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.
Ye Ye Ye Ye Ye The Note:	The hydrology criterion for bog turtle habitat is met. The soils criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality). This wetland HAS potential bog turtle habitat (low to very low quality). This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. The vegetation of the preschafty spring fed. The vegetation of the information provided herein are and complete.
Ye Y	Insure The hydrology criterion for bog turtle habitat is met. NoUnsure The soils criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality). NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). NoUnsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. NoUnsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. NoUnsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). NoUnsure This wetland HAS potential bog turtle habitat (so wetland low to very low quality). NoUnsure This wetland HAS potential bog turtle habitat is met. NoUnsure This wetland HAS potential bog turtle habitat is met. NoUnsure This wetland HAS potential bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure This vegetation criterion for bog turtle habitat is met. NoUnsure This vegetation criterion for bog turtle habitat is met. NoUnsure This vegetation criterion for bog turtle habit
Ye Y	Insure The hydrology criterion for bog turtle habitat is met. The solls criterion for bog turtle habitat is met. The vegetation criterion for bog turtle habitat is met. NoUnsure The vegetation criterion for bog turtle habitat is met. NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality). This wetland HAS potential bog turtle habitat (low to very low quality). We wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present. The hydrology criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Unsure This wetland HAS potential bog turtle habitat (low to very low quality). UNSURE if suitable habitat is present. The hydrology criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation c

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population RangeWetland ID: //NC-W-006(Revised April 29, 2020) Please do not edit document.PNDI # (for PA): 719137
	Property/Project Name Indiantown Grap National Cometary Expunsion Project Coordinates 40.425187, -76.560155 Project Type Expanding existing Gacility
General Info	Entity Requesting Phase 1 Survey Mabbe H & Associates, Inc. County/Township/Municipality East Hanaxut Vinion Turp Lebanon Co. Lead Surveyor Bridge- Thompson Affiliation Thompson Environmental Other Assistants Present Date of Survey 10/07/2020 Time In 12 30 Time Out 12 45 Air Temp. 70 (F°) C°
Date/Condition	Last Precipitation < 24 hours 1-7 days × > 1 week unknown Drought conditions? Yes × No Unknown Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken × Yes No (Provide photo location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed): The region is experiencing Very dry drought like conditions
Wetland info	Wetland Size O.O.Y acres, if known # Wetlands w/in Project Area ² / B Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0% < 5 × 6-20 21-40 41-60 > 60 Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information × Springs/Seeps Springhouse × Trib/Stream Pond × Stormwater fron Bacteria Watercress × Water Visible on Surface
	Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None
	1 (*) Denotes reference to the Supplemental Information document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-006

Yes __ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe: Logaing

etland inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BKD-BerKs Channey silt loam 15 to 25 percent slapes

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of We	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush <i>Eleocharis palustris</i>	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefail Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedg Cyperus esculentu
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.)
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	·
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset (Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: //// W-000
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	Withand is located at the origin/ discharge point of a small
	Intermittent Chancel downslope of the nettend the hydrology
	perons chanelized. Wetland is located in a natural gully in
	a wooded. Shouldby lot.
	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of itAll of itPart of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? XYesNoUnk Habitat off-site? XYesNoUnk
	If yes, how did you conclude this? Phase / Survey for this Project iduthed PBTA
	W/m The study Area
	PHI surveys for previous projects have I dotherd PBTH Win The Watersh
	Ph. solveys is previous projects vave lander los vila to
•	Were any bog turtles observed? Yes XNo If yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.
•	*Note that you must be permitted by the state you
•	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs
	Were any bog turtles observed? Yes XNo If yes, how many? Other herps observed? Yes XNo If yes, which ones? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. *Report bog turtle observations to your local FWS
	Were any bog turtles observed? Yes No If yes, how many?
•	Were any bog turtles observed? Yes No If yes, how many?
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met.
•	Were any bog turtles observed?YesXoIf yes, how many?
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey into handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland is not participated. Wetland Abes not contain muckly substante.
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persistantly Spring Action. Wetland Abes not contain muckly substrate.
	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS Field Diffice and state wildlife office within 48 hrs "Report bog turtle observations to your local FWS
•	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland So Not Contain Nucley Substitute. Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *No provided by the state you are conducting the survey in to handle bog turtle. The post bog turtle observations to your local EWS rield Office and state wildlife office within 48 brg. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). We have does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wethind Is not persistent Spring Red. We thank does not contain mucky substrate. Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridge Thampsan Signature Signature
•	Were any bog turtles observed? Yes XNo If yes, how many? "Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 brs Print Name Bridge No Long Full Signature "Note that you must be permitted by the state you are conducting the survey into handle bog turtles." Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 brs Print Name Bridge. "No Unsure The hydrology criterion for bog turtle habitat is met. Yes XNo Unsure The soils criterion for bog turtle habitat is met. Yes XNO Unsure The vegetation criterion for bog turtle habitat is met. Yes XNO Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes XNO Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes XNO Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes XNO Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not president Suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not president Suitable habitat. Yes XNO Unsure This wetland Is not president Suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not president Suitable habitat is present. Signature Bridge This state of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridge This state Your Suitable Signature Signature

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C-W-007 PNDI # (for PA): 7/9/37
n General Info	Property/Project Name Indiantown Gap National Cemetry Expansion Project Coordinates 40. 420372, -76. 557 410 Project Type Expanding Existing facility Entity Requesting Phase 1 Survey Mabbelt & Associates, Inc. County/Township/Municipality East Hanover + Union Turp. Lebanon Co. Lead Surveyor Bridge Thompson Affiliation Thompson Environmental Other Assistants Present Date of Survey 10/08/2020 Time In 0900 Time Out U9 30 Air Temp. 60 F°C° Last Precipitation < 24 hours 1-7 days × > 1 week unknown Drought conditions? Yes × No Unknown
Date/Condition	Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken X Yes _ No (Provide photo location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed): The region is experiencing very dry dry drought like conditions.
Wetland Info	Wetland Size
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	ING	W-007

X Yes __ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

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etland Inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WED Weikert Channery silt loam 15 to 25 perart slopes

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of We	tland:	*****	<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus colomus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Lorix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.)
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: 1NC-W-007
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	wetland is located in natural gully in wooded-shrubby lot
	Wetland is associated w/ the seasonal groundwater
<u>o</u>	dischared when the gully and convergence of multiple
	epheneral drainges that privide surface runoff.
Landscape Info	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? $\underline{\times}$ Yes No Unk Habitat off-site? $\underline{\times}$ Yes No Unk
	If yes, how did you conclude this? Phase I survey for the projet has idetitied
	PBTTI WIN the projet study area.
Species	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
inion	Yes \(\subseteq \ No \)Unsure The hydrology criterion for bog turtle habitat is metYes \(\subseteq \ No \)Unsure The soils criterion for bog turtle habitat is metYes \(\subseteq \ No \)Unsure The vegetation criterion for bog turtle habitat is metYes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (fair to good quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes \(\subseteq \ No \)Unsure This wetland HAS potential bog turtle habitat (low to very low quality).
or Op	without does not contain micro habitat conditions.
urvey	without does not contain micro habitat conditions.
Lead Surveyor	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridger Thingson Signature Body Dy
	Date 10/08/2020
	Contact Information by Thumpsonesp. com 717-609-3301

Priase 1 boy Turne nabital survey bala Form for the Northern Population Kange	PNDI # (for PA): 7/9/37
(Revised April 29, 2020) Please do not edit document. Property/Project Name Indiantown Gap National Conclevy Expansion Property/Project Name Indiantown Gap National Conclevy Expansion Property/Project Name Indiantown Gap National Conclevy Expansion Project Type Expanding of Entity Requesting Phase 1 Survey Mabbeth & Associates, Inc. County/Township/Municipality East Hanover t Union Tup Lebanon County/Township/Municipality East Hanover t Union Tup Lebanon County/Township/Municipality East Hanover t Union Tup Lebanon County/Township/Municipality Thompson Affiliation Thumps Other Assistants Present Date of Survey 10/08/2020 Time In 1030 Time Out 1045 Last Precipitation < 24 hours 1-7 days × > 1 week unknown Drought conditions?	Existing Facility on Environmental Air Temp. 60 For
Drought Index*¹ (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken ∠ Yes No (Property of the property of t	rovide photo location map) sonal conditions observed): Conditions 5+ 10+ eral wetland information
	ing ⁴ Routine Flooding ⁵) p) d? <u>× Likely Unlikely Unless, berms, culverts, fill material</u>
None	

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland Type/Vegetation

Yes \times No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD - Weiker Channery silt loam 15 to 25 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:	-		<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wetl	and:	<u></u>	in	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp.	Common Reed	Jewelweed	Rice Cutgrass	Spicebush	Willow spp. Salix spp.
Alnus spp.	Phragmites australis	Impatiens capensis	Leersia oryzoides	Lindera benzoin	
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead	Eastern Red Cedar	Poison Sumac	Shrubby Cinquefoil	Sweetflag	Yellow-Green Sedge
Sagittaria latifolia	Juniperus virginiana	Taxicadendron vernix	Dasiphora fruticosa	Acorus calamus	Cyperus esculentus
Carpetgrass	Eastern Tamarack	Porcupine Sedge	Skunk Cabbage	Tearthumb Spp.	
Axonopus fissifolius	<i>Larix laricina</i>	Carex hystericina	Symplocarpus foetidus	<i>Polygonum</i> spp.	
Cattail	Grass-of-Parnassus	Purple Loosestrife	Smooth Sawgrass	. Tussock Sedge	
<i>Typha</i> spp.	Parnassia glauca	Lythrum salicaria	Cladium mariscoides	Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID:
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): WETLAND IS located with a small topographic depression in a wooded- Shribby jot adjacnt to maintained remetery grounds wetland is 4550 crated of the headwater of a small intermitted diagraph 600 cascal groundwater discharge, and scassally high watertable.
ranoscape into	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of itAll of itPart of it (acres or% of the off-site portion) Is there potential bog turtle habitat within 300 feet*? X YesNoUnk Habitat off-site?Yes X NoUnk If yes, how did you conclude this? Phase / Survey for this project I do that PBTH Win the Shay area.
sanade	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
	Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes X No Unsure The soils criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): The wetland is no sufficiently spring fed. The metland Substrates Soft and peristney satisface but het mucky.
	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name
_	Contact Information 6 thompson & Thompsonesp. com 717-609-330/

Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C-W-009 PNDI # (for PA): 7/9/37
Property/Project Name Indiantown Gap National Cemetry Expunsion Project
Coordinates 40-419976, -76.561614 Project Type Expanding Existing Facility
Entity Requesting Phase 1 Survey Mabbell & Associates, Inc.
County/Township/Municipality East Hanover + Union Tup Lebanon Co.
Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
Other Assistants Present
Date of Survey 10/08/2020 Time In 10 45 Time Out 11 60 Air Temp. 60 F9C°
Last Precipitation < 24 hours 1-7 days \times > 1 week unknown Drought conditions? Yes \times No Unknown
Drought Index*1 (Circle): none D0 1 D2 D3 D4 Wetland Photos Taken Yes No (Provide photo location map)
Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
The region is experiencing very dry drought like conditions.
Wetland Size 0.04 acres, if known # Wetlands w/in Project Area ² 18
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
Estimate % Canopy Cover* ³ 0% ≤ 5 6-20 21-40 41-60 > 60
Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
Springs/Seeps Springhouse $ imes$ Trib/Stream $_{-}$ Pond $ imes$ Stormwater $_{-}$ Iron Bacteria $_{-}$ Watercress
Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
imes Small Puddles/Depressions ($ o$ inches deep) $ imes$ Saturated soils present? If yes, year-round? $ imes$ Likely $ o$ Unlikely Unl
Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
ponds, roads, beaver activity)? Without is when a constructed smale that
Yes _ No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Without is whin a constructed smale that received smale that receives surface and off from upslope maintained cemetery younds
Estimate time period (in years) of disturbance*: $\leq 5 \times 6-10 = 11-20 = 20$
Estimate time period (in years) of disturbance*: ≤ 5 ×6-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-009
Welland ID.	7.10

X Yes _	_ No	Are there	any signs of	disturba	ance to <u>vegetation</u>	(e.g., mowing,	pasturing, burning)?	If yes, describe:
WE	tlana	1 13	WIIn	a	constructed	Swale		

etland info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD- Wellert channey sitt loam 15 to 25 percent slopes

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

"	a observe mar an		tene notes space p			
	Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
	Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
	American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
	Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
	Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp	
	Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
	Cinnamon Fern Osmundastrum cinnomomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
	Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe su					Wetland ID: NC-	,, ,,
	rrounding landsca	pe (e.g., wetland	ls, forest, subdivision	n, agricultural field, fallow	field, etc.):	
Wetlar	nd is loc	ated in	a constru	trd swale	at the edge	de
am	amtamed	cenetary	grounds	wetland is	s associate	
W	storm was	le disc	harge inte	the smale	and excess	non
10	The seas	ional qu	nunt water	- level.		
How much	\times None of it – t	he entire wetla	nd is within the pr	property boundaries or operty boundaries land appears to be loca		
If part of th	nis wetland continu	ues off-site, hov	v much of the off-	site portion was survey	ved (on foot)?	
	None of it _	_ All of it P	art of it (acre	es or% of the off-s	site portion)	
Is there po	tential bog turtle h	nabitat withIn 3	00 feet* ? <u>X</u> Yes	No Unk Habi	tat off-site ? Yes $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	NoUnk
					project has	
	when the			7 100 73	pro) (2.	, , , , , ,
PBIFI	MITTER TON	J, 2019 -12				
					Field Office and state wildli	te office within 48 h
Yes >	∠NoUnsure	The soils crite	rion for bog turtle	turtle habitat is met. habitat is met. turtle habitat is met.		
				turtle habitat (fair to g		
res _/				turtle habitat (low to v UNSURE if su	ery low quality). itable habitat is present.	
	etland does NOT h		•	~		
∑ This w				1	a a salash	
∑ This we Notes (He	ow did you reach t	his opinion?):	wetland	Is not p	ersistaty spi	
X This we Notes (How	ow did you reach t	his opinion?):	contain w	rucky substra	rte.	ung Fri
X This we Notes (Ho WATA	ow did you reach than does	his opinion?): not	nave veg	rucky substructive structure	or micro-ha	ung ku betak
Notes (Howard)	ow did you reach than does	his opinion?): not	nave veg	rucky substructive structure	rte.	ung ku betak
Notes (Ho WATA Lead Survaccurate a	ow did you reach to dank does does veyor – please signand complete.	his opinion?): not not not below certifyin	nave vey	our knowledge that all	or micro-ha	ung ku betak
Notes (Howard) Notes (Howard)	ow did you reach the series of	his opinion?): not not below certifyin Thomps	nave vey	rucky substructure	or micro-ha	ung ka Ibtat
Notes (Ho	ow did you reach to And does reyor - please sign and complete. Des 12020	his opinion?): not not below certifyin Thomps	nave veg	Tucky Substrated Structure Structure Balling	or micro-ha	ung ha
Notes (Ho	ow did you reach to And does reyor - please sign and complete. Des 12020	his opinion?): not not below certifyin Thomps	nave veg	Tucky Substrated Structure Structure Balling	or micro-ha	ung ha

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document.	Wetland ID: <u>////-W-0/0</u> PNDI # (for PA): <u>7/9/3</u> 7
General Info	(Revised April 29, 2020) Please do not edit document. Property/Project Name Indiantown Gap National Cemetry Expans. Coordinates 40. 420 604, -76. 559229 Project Type Expanding. Entity Requesting Phase 1 Survey Mabbeth i Associates, Inc. County/Township/Municipality East Hanover & Union Turp Laborated Surveyor Bridger Thompson Affiliation Than Other Assistants Present Date of Survey 10/08/2020 Time In 11.30 Time Out 11.45	non Co. Myson Environmental
Date/Condition	Last Precipitation < 24 hours 1-7 days > 1 week unknown Drought conditions? Drought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken Yes No (Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other se The region is experiencing very dry dry drought like	Provide photo location map) asonal conditions observed):
Wetland Info	Wetland Size 0.0/ acres, if known #Wetlands w/in Project Area ² /8 Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 Estimate % Canopy Cover* ³ 0% < 5 6-20 21-40 41-60 > 60 Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent ge Springs/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacte Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Floo Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep Small Puddles/Depressions (inches deep) Saturated soils present? If yes, year-row Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drain ponds, roads, beaver activity)?	neral wetland information ria Watercress rding ⁴ Routine Flooding ⁵) reep) und? <u>X</u> Likely Unlikely Unk
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:	
	None	

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: INC-W-010

__ Yes \times No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD- Weikert Channey 5.11 loan 15 to 25 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage: None

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	in.
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of We	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	lewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Carnus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolio	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedg Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	begga-s tick
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

				Wetland II	D: <i>/NC-W</i>	-010
1 W d	andscape (e.g., wetlands, ocafed in a	unaded - Shed	bhylot	atthe	neg d	water charas
From upslog	peared in a finall cphemen oe maintaine/ wetland	divoloped.	to the	depresso	nal	topo
✓ None of	and is located off-site (<i>i.</i> f it – the entire wetland of it –Acres or	is within the property	boundaries			
If part of this wetland	continues off-site, how r	much of the off-site po	rtion was survey	red (on foot)?		
None o	fitAll of itPar	t of it (acres or	% of the off-s	ite portion)		
is there potential bog t	urtle habitat within 30 0) feet*? × Yes No	Unk Habit	tat off-site? Y	es 🗶 No	Unk
If yes, how did you con	clude this? The	Phase / Surve	y conduct	ted por	tuis ,	Project
I dest Fred	PBTH WIN	the stade	ana.			
, , , , , , , , , , , , , , , , , , , ,	•		r			
Were any bog turtles of Other herps observed	observed? Yes <u>×</u> N 2 _Yes <u>×</u> No If yes	lo If yes, how ma s, which ones?	nγ?	are conductin	ng the survey in to turtle observation	ted by the state you handle bog turtles s to your local FWS flice within 48 hrs.
YesNoUYesNoUYesNoUYesNoUYesNoUYesNoUYesNoU	observed? Yes No If yes No If yes No If yes No If yes nsure The hydrology on the registration of the wegetation of the wetland HANOT have potential bog	criterion for bog turtle I on for bog turtle habita criterion for bog turtle AS potential bog turtle I AS potential bog turtle I	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to vo	are conductin *Report bog to Field Office ar Dod quality). ery low quality).	ig the survey in to turtle observation nd state wildlife o	handle bog turtles s to your local FWS
Yes _NoUYes _NoU	P Yes No If yes nsure The hydrology on nsure The soils criterion nsure This wetland HA nsure This wetland HA NOT have potential bog each this opinion?):	criterion for bog turtle lon for bog turtle habita criterion for bog turtle has potential bog turtle las potential bog turtle las turtle habitat.	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to vo UNSURE if su	ere conduction *Report bog to Field Office are pood quality). ery low quality). itable habitat is ng Report.	ig the survey in to turtle observation and state wildlife o	handle bog turtles s to your local FWS flice within 48 hrs.
Yes _NoUYes _NoU	P Yes No If yes nsure The hydrology on nsure The soils criterion nsure This wetland HA nsure This wetland HA NOT have potential bog each this opinion?):	criterion for bog turtle lon for bog turtle habita criterion for bog turtle has potential bog turtle las potential bog turtle las turtle habitat.	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to vo UNSURE if su	ere conduction *Report bog to Field Office are pood quality). ery low quality). itable habitat is ng Report.	ig the survey in to turtle observation and state wildlife o	handle bog turtles s to your local FWS flice within 48 hrs.
Yes _NoUYes _NoU	P Yes No If yes nsure The hydrology on nsure The soils criterion nsure This wetland HA nsure This wetland HA NOT have potential bog each this opinion?):	criterion for bog turtle lon for bog turtle habita criterion for bog turtle has potential bog turtle las potential bog turtle las turtle habitat.	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to vo UNSURE if su	ere conduction *Report bog to Field Office are pood quality). ery low quality). itable habitat is ng Report.	ig the survey in to turtle observation and state wildlife o	handle bog turtles s to your local FWS flice within 48 hrs.
Yes No U Yes I No U	nsure The hydrology of nsure The soils criterion sure The vegetation This wetland HANOT have potential bog each this opinion?): Les not loss se sign below certifying te.	criterion for bog turtle I on for bog turtle habita criterion for bog turtle has potential bog turtle I g turtle habitat. Within habitat. Contain vig. to the best of your known in the best of your known in the label in the label in the best of your known in the label in the	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to voUNSURE if suSprii ky subst Structure o	are conduction *Report bog to Field Office are pood quality). ery low quality). itable habitat is pood quality. itable habitat is	present.	handle bog turtles s to your local FWS ffice within 48 hrs.
Yes No U Yes I No U	nsure The hydrology of nsure The soils criterion sure The vegetation This wetland HANOT have potential bog each this opinion?): Les not loss se sign below certifying te.	criterion for bog turtle I on for bog turtle habita criterion for bog turtle has potential bog turtle I g turtle habitat. Within habitat. Contain vig. to the best of your known in the best of your known in the label in the label in the best of your known in the label in the	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to voUNSURE if suSprii ky subst Structure o	are conduction *Report bog to Field Office are pood quality). ery low quality). itable habitat is pood quality. itable habitat is	present.	handle bog turtles s to your local FWS flice within 48 hrs.
Yes _NoUYes _No _UYes _No _U	nsure The hydrology of nsure The soils criterion sure The vegetation This wetland HA NOT have potential bog each this opinion?): Lees not loes not see sign below certifying te.	criterion for bog turtle I on for bog turtle habita criterion for bog turtle has potential bog turtle las potential bog turtle las turtle habitat. William des much conformation was signature.	nabitat is met. t is met. habitat is met. nabitat (fair to go nabitat (low to vo UNSURE if su Ly Sybst Structure of owledge that all of	are conduction *Report bog to Field Office are field of the information of the inform	present.	handle bog turtles s to your local FWS ffice within 48 hrs.

Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range Revised April 29, 2020) Please do not edit document. Wetland ID: 1/VC-W-01/ PNDI # (for PA): 7/9/37
Property/Project Name Indiantown Gap National Cemetral Expunsion Project
Coordinates 40, 421766, -76.560199 Project Type Expanding Existing Facility
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
County/Township/Municipality East Hanover + Union Tup. Lebanin Co.
ead Surveyor Bridger Thompson Affiliation Thompson Environment
Other Assistants Present
Date of Survey 10/08/2020 Time In 1200 Time Out 1215 Air Temp. 70 F°C°
Last Precipitation _ < 24 hours _ 1-7 days \times > 1 week _ unknown Drought conditions? _ Yes \times No _ Unknown
Drought Index*1 (Circle): none D0 (D1) D2 D3 D4 Wetland Photos Taken XYes No (Provide photo location map)
Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
The region is expensions very dry drought like conditions
The region is companied
Estimate wetland size acres, if known #Wetlands w/in Project Area ² Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0% < 5 6-20 21-40 41-60 > 60 Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information Springs/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacteria Watercress Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding Routine Flooding No If yes, (Seasonal Flooding Routine Flooding Short Stormwater Iron Bacteria Watercress Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding Routine Flooding No If yes, (Seasonal Flooding No No No
Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $_ > 20$
For ditches that may be present, is there bog turtle habitat? If yes, describe:
None

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

 $^{^{2}}$ Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC W-011

___Yes \times No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

stland infe

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD - Weikert Channey silt loam 15 to 25 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

None

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	107-	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	in.
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	land: <u>907-</u>	wond	<i>M/A</i> in.	M/A in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Waoily-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedg Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix Iaricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	bulrush
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field Withand is a Virnal pool of vegetated fring. Iccerves surface runoff from upslope many And fill area. How much of this wetland is located off-site (i.e., outside the property boundaries or right X None of it — the entire wetland is within the property boundaries Some of it — Acres or — % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (i.e., outside the property boundaries or right X None of it — Hacres or — % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (i.e., outside the property boundaries or right Y none of it — Acres or — % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (i.e., outside the property boundaries or right If part of this wetland continues off-site (i.e., outside the property boundaries or right X None of it — the entire wetland is within the property boundaries or right Y no — Machine Portion If part of this wetland continues off-site, how much of the off-site portion was surveyed (i.e., outside the property boundaries or right Y no — Machine Portion Y no — Machine Portion Y no — Machine Portion Y no — Unk Habitat of the property boundaries or right Y no — Machine Portion Y no — Machine Portion	t-of-way)? off-site on foot)? off-site?Yes × NoUnk
How much of this wetland is located off-site (i.e., outside the property boundaries or right None of it – the entire wetland is within the property boundaries Some of it – Acres or % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (in None of it All of it Part of it (acres or % of the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Part of it (acres or % of the off-site position) is the off-site position was surveyed (in None of it All of it Al	t-of-way)? off-site on foot)? off-site?Yes × NoUnk
How much of this wetland is located off-site (i.e., outside the property boundaries or right None of it – the entire wetland is within the property boundaries Some of it – Acres or % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (in None of it All of it Part of it (acres or % of the off-site point is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the set	t-of-way)? off-site on foot)? portion) off-site?Yes × NoUnk
How much of this wetland is located off-site (i.e., outside the property boundaries or right None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (in None of it All of it Part of it (acres or % of the off-site points is there potential bog turtle habitat within 300 feet*? Yes No Unk Habitat of If yes, how did you conclude this? The Phase / Survey for And / Survey for And / Survey for And / Survey for / And	off-site on foot)? portion) off-site?Yes × NoUnk
X None of it – the entire wetland is within the property boundaries Some of it – Acres or % of the wetland appears to be located If part of this wetland continues off-site, how much of the off-site portion was surveyed (None of it All of it Part of it (acres or % of the off-site point is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the second of the off-site point is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the second of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the property of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the off-site point is the potential bog turtle habitat within 300 feet*. X Yes No Unk Habitat of the off-site point is the off-site point is the off-site point is the off-site point is the off-site poin	off-site on foot)? portion) off-site?Yes × NoUnk
None of it All of it Part of it (acres or % of the off-site p is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat of the set of	oortion) off-site?Yes × NoUnk
is there potential bog turtle habitat within 300 feet*? X YesNoUnk Habitat of If yes, how did you conclude this? The Phase I survey for the	off-site?Yes <u>X</u> NoUnk
If yes, how did you conclude this? The Phase I survey for the	
If yes, how did you conclude this? The Phase I survey for the	is Project
Identified PBTH win the study area.	
Were any bog turtles observed?Yes $\stackrel{\checkmark}{\succeq}$ No If yes, how many?	*Note that you must be permitted by the state y are conducting the survey in to handle bog turth
Other herps observed?YesXNo If yes, which ones?	*Report bog turtle observations to your local FV
	Field Office and state wildlife office within 48 hrs
Yes Yes 	
Yes Onsure The soils criterion for bog turtle habitat is met.	
Yes X No Unsure The vegetation criterion for bog turtle habitat is met.	
Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good	quality).
Yes No Unsure This wetland HAS potential bog turtle habitat (low to very l	ow quality}.
∠ This wetland does NOT have potential bog turtle habitat. _ UNSURE if suitable.	le habitat is present.
Notes (How did you reach this opinion?): wetland is a vennal	pool.
no vig structure.	
NU MICHO- habitest conditions	
Lead Surveyor – please sign below certifying to the best of your knowledge that all of th accurate and complete.	e information provided herein is
Print Name Bridger I hompson Signature Bolly	hyse
Date 10/08/2020	
Contact Information bthompsonesp. com 717	1 -0
Contact Information bTh ompsonesp. com 17	-609-330/

	ed April 29, 2020) Please do not edit document. Wettand ID:
Prope	rty/Project Name Indiantown Gap National Connetery Exponsion Project.
Coord	inates 40.421950, -76.56/219 Project Type Expanding Existing Facility
	Requesting Phase 1 Survey Mabbett & Associates, Inc.
	y/Township/Municipality East Hanover + Union Tup Lebanan Co
Lead 5	surveyor Bridge Thompson Affiliation Thompson Environmenta
	Assistants Present
Date	of Survey 10/08/2020 Time In 1230 Time Out 1300 Air Temp. 70 FOCO
Last P	recipitation _ < 24 hours _ 1-7 days × > 1 week _ unknown Drought conditions? _ Yes X No _ Unknown
	tht Index*1 (Circle): none D0 📵 D2 D3 D4 Wetland Photos Taken 🔀 Yes No (Provide photo location map)
	(e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
7	he region is experiencing very dry drought like conditions.
//	a region is expandency of the
	and Size 0.20 acres, if known # Wetlands w/In Project Area ² 18 ate wetland size (acres) _ < 0.1 _ 0.1 - 0.5 _ 0.5 - 1 _ 1 - 2 _ 2 - 4 _ 5 + _ 10 +
	ate % Canopy Cover*3 0% ≤ 5 × 6-20 21-40 41-60 > 60
	logy and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
×s	orings/SeepsSpringhouse × Trib/StreamPond × StormwaterIron BacteriaWatercress
	/ater Visible on Surface Evidence of Flooding × Yes No If yes, (Seasonal Flooding A Routine Flooding S)
	ivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	mall Puddles/Depressions (inches deep) 🔀 Saturated soils present? If yes, year-round? 🔀 Likely Unlikely
	es No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
1	noods, beaver activity)? We thank receives suffice run off from upstope
Estim	ate time period (in years) of disturbance*: $\underline{} \le 5$ $\underline{} 6-10$ $\underline{\cancel{X}} 11-20$ $\underline{} > 20$
For di	tches that may be present, is there bog turtle habitat? If yes, describe:
	None

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-	W-012	

__ Yes $\frac{\chi}{}$ No Are there any signs of disturbance to $\underline{vegetation}$ (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

CMB - com/y silt loam 3 to 8 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	108%	None	N/A in.	11/A in.
PSS Portion of Wetland:		<u> </u>	in	<u>in.</u>
PFO Portion of Wetland:	102		<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wes	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. <i>Alnus</i> spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagitt <i>aria latifolia</i>	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefail Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	(bulrush
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: _/NC-W-0/Z
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	wetland is located in wooded-shrubby lot down slape of
	mointained cemetery grounds wetland is associated of arca
	of sensonal ground water Aischarge and surface runoff colletion
	that becomes steeply incised INT channel.
	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes Yno Unk
	If yes, how did you conclude this? The Phase I survey for this Project , dutifie.
	PBTH w/m the study area
	1011 wyld 12 croud dold
	Were any bog turtles observed?YesX NoIf yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?YesX NoIf yes, which ones?
•	Yes ∠NoUnsure The hydrology criterion for bog turtle habitat is metYes ∠NoUnsure The soils criterion for bog turtle habitat is metYes ∠NoUnsure The vegetation criterion for bog turtle habitat is metYes ∠NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality)Yes ∠NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). ∠_Yes wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
	Notes (How did you reach this opinion?): Wetland is no persistently spring fed.
	wetland does not contain mucky substrate untland does not contain vegetative structure or micro-habitat conditions
	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridge- Thompson Signature Buly hyper
	Date 10/08/2020
	Contact Information 6 thompson & Thompsonesp. com 717-609-3301
1	

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: 7/19/37 PNDI # (for PA): 7/9/37
	Property/Project Name Indiantown Carp National Cemetry Expunsion Project
	Coordinates 40.423140, -76.560306 Project Type Expanding Existing Facility
General Info	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
era	County/Township/Municipality East Hanover & Union Top Lebanon Co.
Gen	Lead Surveyor Bridge- Thompson Affiliation Thompson Environmentar
	Other Assistants Present
	Date of Survey 10 10 8 202 Time In 1330 Time Out 13 45 Air Temp. 70 Foro Last Precipitation < 24 hours 1-7 days ×>1 week unknown Drought conditions? Yes × No Unknown
Date/Condition	Drought Index*¹ (Circle): none D0 DD D2 D3 D4 Wetland Photos Taken ★ Yes No (Provide photo location map)
g	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
rte/	The region is experiencing very dry drought like conditions
Õ	The region is experience
	Wetland Size 0,01 acres, if known # Wetlands w/in Project Area ² 18
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover*3 0% ≤ 5 6-20 21-40 41-60 > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	Springs/Seeps Springhouse X Trib/Stream Pond Y Stormwater Iron Bacteria Watercress
	Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	Small Puddles/Depressions (inches deep) $ imes$ Saturated soils present? If yes, year-round? $ imes$ Likely Unlikely Unk
Info	Yes XNO Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
Wetland Info	
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None

¹ (*) Denotes reference to the **Supplemental Information** document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-013
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__ Yes \times No Are there any signs of disturbance to $\underline{vegetation}$ (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*: cm B- Comly sitt loam 3 to 8 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	1064.	None	N/A in.	\sim /A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		in.	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoln	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Wooily Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	2.2	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoldes	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document.	PNDI # (for PA): 7/9/3 7
	Property/Project Name Indiantown = 4p National Cemetry Expansi	" Project
	Coordinates 40. 425 439, -76.564939 Project Type Expanding	
	Entity Requesting Phase 1 Survey Mabhett & Associates, Inc.	•
	County/Township/Municipality East Hanover 1 Union Tup. Lebanon	. Co.
	Lead Surveyor Bridger Thompson Affiliation Thom	pson Environmental
	Other Assistants Present Emma Fernandes	
	Date of Survey 10/07/20 Time In 1/45 Time Out 1200	Air Temp. 60 (F)C°
	Last Precipitation < 24 hours 1-7 days \times > 1 week unknown Drought conditions?	Yes 🔀 No Unknown
	Drought Index*1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken X Yes No (F	rovide photo location map)
3	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other sea	sonal conditions observed):
Jate/ Containion	The region is experiencing very dry drought like con	ditions.
	Wetland Size _0.04 acres, if known # Wetlands w/in Project Area ² / 8	
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4	5+ 10+
	Estimate % Canopy Cover*3 0% ≤ 5 6-20 21-40 41-60 > 60	-
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent gen	eral wetland information
	Springs/SeepsSpringhouse X_Trib/StreamPondStormwaterIron Bacter	
	Water Visible on Surface	
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches de	
	Small Puddles/Depressions (inches deep) \(\times \) Saturated soils present? If yes, year-roun	
	Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile draina	
•	ponds, roads, beaver activity)?	ges, dernis, cuiverts, na materiai,
ALCERIA IIII		
	Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20	
	For ditches that may be present, is there bog turtle habitat? If yes, describe:	

¹ (*) Denotes reference to the **Supplemental information** document that provides more details on this particular question.

 $^{^{2}}$ Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-014

__ Yes $\underline{\times}$ No Are there any signs of disturbance to $\underline{vegetation}$ (e.g., mowing, pasturing, burning)? If yes, describe:

etland Inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BKD- BevKs Channery sill loam 15 to 25 percent stopes

How much suitable habitat is in this wetland? Estimate acreage or percentage: ______None__

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	106%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in,</u>
POW/PUB Portion of Wet	land:		<u>in.</u>	<u> </u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: NC-W-014
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	Withand is located on floodplain bench at toe- of -slope
	withand is associated w/ seasonal high groundwater and
	wetland is associated w/ seasonal high groundwater and seasonal toe of slope groundwater discharge.
Landscape Info	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? Yes No Unk Habitat off-site? Yes No Unk
	If yes, how did you conclude this? Phase I survey conducted for this project I duthful PBTH who the study area. PHI surveys conducted for previous projects identified PBTH notes the make shed.
Species	Were any bog turtles observed?Yes _k_ NoIf yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed?Yes _k_ NoIf yes, which ones?
	Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
r Opinion	Notes (How did you reach this opinion?): Wetland is no persistently spring ted wetland dues not contain mucky substracte.
Lead Surveyor Op	wetland does not have vegetative structure of micro hab.
read (Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridge Thompson Signature Boly Sty
	Date 10/07/2020
	Contact Information 6 thompson@ thompsonesp. com 717-609-330/

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document.	PNDI # (for PA): 7/9/37
	Property/Project Name Indiantown Gap National Cometay Expansion	Project
	Coordinates 40.425980, 76.554801 Project Type Expending	Existing Facility
	Entity Requesting Phase 1 Survey Mabbell & Associates Inc.	
dellel di	County/Township/Municipality East Haharer + Union Tup. Lebanon	Co
5	Lead Surveyor Bridger Thompson Affiliation Thompson	pron Environmental
	Other Assistants Present	
	Date of Survey 10/07/2020 Time In 13/5 Time Out 1330	
Š	Last Precipitation $\underline{}$ < 24 hours $\underline{}$ 1-7 days $\underline{}$ > 1 week $\underline{}$ unknown Drought conditions?	
į	Drought Index*1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken X Yes _ No (F	
Date/Condition	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other sea	
5	The region is experiencing very dry drought like con	dituri >
	Wetland Size <u>0.04</u> acres, if known # Wetlands w/in Project Area ² <u>/8</u>	
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4	5+ 10+
	Estimate % Canopy Cover*3 × 0% ≤ 5 6-20 21-40 41-60 > 60	
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent ger	
	★ Springs/Seeps Springhouse ★ Trib/Stream Pond Stormwater Iron Bacter	
	Water Visible on Surface Evidence of Flooding X Yes No If yes, (X Seasonal Flooding X Yes No If yes, (X Season	
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches de	
	Small Puddles/Depressions (inches deep) \(\sum \) Saturated soils present? If yes, year-rou	
	Yes \(\sum No \) Are there any signs of disturbance to \(\frac{hydrology}{a} \) (e.g., drainage ditches, tile drainage ponds, roads, beaver activity)?	ges, berms, culverts, fill material,
Ĕ	, , , , , , , , , , , , , , , , , , ,	
wetland into		
2		
	Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20	
	For ditches that may be present, is there bog turtle habitat? If yes, describe:	
	Nint	
	1 (*) Denotes reference to the Supplemental Information document that provides more details on this p 2 Each wetland must have a separate Phase 1 habitat assessment data form completed.	articular question.
	³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species	are those that are most prominen

in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

						Wetland	I ID:	16-W-015	
⊻Yes No	Are the	ere any sig	gns of	disturbance to <u>vege</u>	tation (e.g., mowing, pa	sturing, burning)? If ye	es, descr	ibe:	
Wetland	15	w/in	9	periodically	maintained	Avansmission	line	ROW	

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BKD. Berks Channery silt loam 15 to 25 percent slapes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wes	tland:		in	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

		tore traces chartely			
Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagitt <i>aria latifalia</i>	Eastern Red Cedar Juniperus virginiona	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.)
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
Common Baneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium Vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

г	Wetland ID:
	escribe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	Withand is located on a flood plain beach and at the toe-of-si
	W/m a periodically maintained transmission line ROW. The wetland
	15 associated w/ seasonal ground wanter discharge at the toe-cts
	and seasonal high groundwider associated of the chancel
	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
į	f part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
١	s there potential bog turtle habitat within 300 feet*? \underline{X} Yes $\underline{\hspace{0.4cm}}$ No $\underline{\hspace{0.4cm}}$ Unk Habitat off-site? \underline{X} Yes $\underline{\hspace{0.4cm}}$ No $\underline{\hspace{0.4cm}}$ Unk
ı	fyes, how did you conclude this? The phase! survey conducted for this project identified PBTH w/m the project study area
,	PREVENS PHI SURVEY have identified PBTE mylos The material
1	Vere any bog turtles observed?YesNoIf yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?YesNoIf yes, which ones?
	The herps observed?YesX NoIf yes, which ones? YesX NoUnsureThe hydrology criterion for bog turtle habitat is metYesX NoUnsureThe soils criterion for bog turtle habitat is metYesX NoUnsureThe vegetation criterion for bog turtle habitat is metYesX NoUnsureThe vegetation criterion for bog turtle habitat is metYesX NoUnsureThe vegetation criterion for bog turtle habitat is metYesX NoUnsureThis wetland HAS potential bog turtle habitat (fair to good quality).
_	The representation of the sold
_	The hydrology criterion for bog turtle habitat is met. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present.
_	The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The soils criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is \(not \) persistently spring Had \(\subseteq \subse
_	The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The soils criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\subseteq \) No \(\subseteq \) Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is \(not \) persistently spring Had \(\subseteq \subse
_	The hydrology criterion for bog turtle habitat is met. Yes \(\sum \) No \(\sum \) Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\sum \) No \(\sum \) Unsure The soils criterion for bog turtle habitat is met. Yes \(\sum \) No \(\sum \) Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\sum \) No \(\sum \) Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\sum \) No \(\sum \) Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. \(\sum \) UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): \(\sum \) Wethand is not \(\sum \) Prince Habitat (Spring Habitat).
_	The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The soils criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland is not persistedly spring ted wetland does not contain mucky substrate. Wetland does not contain mucky substrate. Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
_	The hydrology criterion for bog turtle habitat is met. Yes \(\times \) NoUnsure The hydrology criterion for bog turtle habitat is met. Yes \(\times \) NoUnsure The soils criterion for bog turtle habitat is met. Yes \(\times \) NoUnsure The vegetation criterion for bog turtle habitat is met. Yes \(\times \) NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\times \) NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\times \) NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\times \) NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes \(\times \) NoUnsure This wetland HAS potential bog turtle habitatUNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persistedly spring fed Wetland does not contain mucky substrate. Wetland does not contain mucky substrate. Wetland does not have vegetative structure or micro-habitat cand. Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is
_	The hydrology criterion for bog turtle habitat is met. Yes × No Unsure The hydrology criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The vegetation criterion for bog turtle habitat is met. Yes × No Unsure The vegetation criterion for bog turtle habitat is met. Yes × No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat. Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat. Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure The vegetation criterion for bog turtle habitat is met. Yes × No Unsure The vegetation criterion for bog turtle habitat is met. Yes × No Unsure The vegetation criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure The soils criterion for bog turtle habitat is met. Yes × No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No Unsure This wetland HAS potential bog turtl

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	og Turtle Habitat Survey Data Form for the Northern Population Range (il 29, 2020) Please do not edit document.	Wetland ID: /// W-076 PNDI # (for PA): 7/9/3 7
Property/P	roject Name Indiantown Gap National Cometery Expansion Pr	aject
Coordinate	s 40.426610, -76.556800 Project Type Expanding	Existin Facility
	uesting Phase 1 Survey Mubbett & Associates, Inc.	
County/To	waship/Municipality East Hanover 1 Union Two Lebanon C	0.
Lead Surve	yor Bridger Thompson Affiliation Thom	pson Environmental
	stants Present	
Date of Sur	rvey 15/07/2020 Time In 1345 Time Out 1415	Air Temp. 70 F°t°
Last Precip	itation < 24 hours 1-7 days × > 1 week unknown Drought conditions?	_Yes ∠No _Unknown
Drought In	dex*1 (Circle): none D0 01 D2 D3 D4 Wetland Photos Taken X Yes No ((Provide photo location map)
	details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other se region is experiencing very dry drought like condi-	
Estimate w Estimate % Hydrology Spring: Water Rivulet Small F	retland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 Canopy Cover*3 0% ≤ 5 6-20 21-40 41-60 > 60 and Soils (check all that apply): use additional pages to further discuss pertinent gets/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacter Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flootist (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep) Puddles/Depressions (inches deep) Saturated soils present? If yes, year-row No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drain is, beaver activity)?	eneral wetland information eria Watercress oding ⁴ Routine Flooding ⁵) eep) und? <u></u> Likely Unlikely Un
Estimate ti	me period (in years) of disturbance*: ≤ 56-1011-20 > 20	
For ditches	s that may be present, is there bog turtle habitat? If yes, describe:	
No	ne	
	es reference to the Supplemental Information document that provides more details on this	

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-0/10

Yes XNo Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Ho- Holly SIH loam

How much suitable habitat is in this wetland? Estimate acreage or percentage: None

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	106%	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in,</u>
PFO Portion of Wetland:			<u>in.</u>	in,
POW/PUB Portion of Wet	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capenals	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzola	Willow spp. Salix spp,
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoll Dasiphora fruticasa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	dapanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabro	

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): Wethand is located in and along fleed plan of a small period waterwise without is associated off seasonal high water hable and occational founding from Surface without his wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries or right-of-way)? X None of it – Acres or — % of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it — All of it — Part of it (acres or — % of the off-site portion) Is there potential bog turtle habitat within 300 feet*? X Yes _ No _ Unk Habitat off-site? X Yes _ No _ Ur If yes, how did you conclude this? The Phase / Survey for This project individual PBTH with the project study area. Phase / Survey for This project study area. Were any bog turtles observed? Yes X No If yes, which ones? Were any bog turtles observed? Yes X No If yes, which ones? "Report tog turtle office and state widelite office withind office and state widelite office withind yer." Yes X No Unsure The soils criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat is met. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland / S not pursuable withind or micro habitat withind dees not contain wegitathed studyed that all of the information provided herein accurate and complete. We will have a contain wegitathed studyed or micro habitat withind accurate and complete and complete.
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it — the entire wetland is within the property boundaries Some of it — Acres or
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it — the entire wetland is within the property boundaries Some of it — Acres or — % of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it — All of it — Part of it (acres or % of the off-site portion) Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? X Yes No Un If yes, how did you conclude this? The Phase / Survey for This project individual PBTH when the project shady area. Phase / Survey for This project individual Phase / Survey for This project individual PBTH when the project shady area. Phase / Survey for This project individual PBTH when the project shady area. Phase / Survey for Defende beginning to the soils criterion for bog turtle habitat is met. Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (for very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is Out for pure for the pure habitat is met. Wetland does not contain necks substande Wetland does not contain necks substande or micro-habitats
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None of itAll of itPart of it (acres or% of the off-site portion) Is there potential bog turtle habitat within 300 feet*? XesNoUnk Habitat off-site? XesNoUn Habitat off-site? XesNoIf yes, how many? *Note that you must be permitted by the starce and using the survey in to handle bog to the representation of the survey in to handle bog to the representation of the post of the survey in to handle bog to the representation of the post off-site within 4. Yes XesNoUnsureThe hydrology criterion for bog turtle habitat is met. Yes XesNoUnsureThe soils criterion for bog turtle habitat is met. Yes XesNoUnsureThe soils criterion for bog turtle habitat is met. Yes XesNoUnsureThe soils criterion for bog turtle habitat (fair to good quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (fair to good quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality). Yes XesNoUnsureThis wetland HASNotential bog turtle habitat (low to very low quality). Yes XesNoUnsure
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Is there potential bog turtle habitat within 300 feet*? × Yes _ No _ Unk Habitat off-site? × Yes _ No _ Ur If yes, how did you conclude this? The Phase / survey for This project identificated PBTH who the project study area. Phase / survey for This project identificated PBTH who the project study area. Phase / survey for prenew projects have identified PBTH who the made are conducting the survey in to handle beg to the representation to your location for post turtle habitat is met. Yes × No _ Unsure The hydrology criterion for bog turtle habitat is met. Yes × No _ Unsure The soils criterion for bog turtle habitat is met. Yes × No _ Unsure The wegetation criterion for bog turtle habitat is met. Yes × No _ Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (for to good quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (survey low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes × No _ Unsure This wetland HAS potential bog turtle habitat is met. Yes × No _ Unsure This wetland HAS potential bog turtle habitat is met. Yes × No _ Unsure This wetland HAS potential bog turtle habitat is met. Yes × No _ Unsure This wet
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Withing does not contain vegetative structure or micro-habitate conditions. Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein
Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein
Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein
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decurate and complete.
Date 10/07/2020 Signature Bright Signature
Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided here

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range Revised April 29, 2020) Please do not edit document. Wetland ID:
	Property/Project Name Indiantown Gap National Cemetery Expansion Project
(Coordinates 40. 426539, -70 555554 Project Type Expanding Existing Facility
	Entity Requesting Phase 1 Survey Mabbe # & Associates, Inc.
	County/Township/Municipality East Hanove- + Union Tup Lebanon Co
	ead Surveyor Bridge- Thompson Affiliation Thompson Environmetal
	Other Assistants Present
	Date of Survey 10/07/2020 Time In 1406 Time Out 1430 Air Temp. 70 (F°)C°
ı	Last Precipitation < 24 hours 1-7 days $\stackrel{\textstyle imes}{} >$ 1 week unknown Drought conditions? Yes $\stackrel{\textstyle imes}{} =$ No Unknown
1	Drought Index*1 (Circle): none D0 (D1) D2 D3 D4 Wetland Photos Taken XYes No (Provide photo location map)
1	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed):
	The region is experiencing very dry drought like conditions.
-	1 4 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
	Wetland Size <u>0,02</u> acres, if known # Wetlands w/in Project Area ² /8
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover* ³
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	imes Springs/Seeps Springhouse Trib/Stream Pond $ imes$ Stormwater Iron Bacteria Watercress
	Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding⁴ Routine Flooding⁵)
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	∑ Small Puddles/Depressions (/ inches deep) ∑Saturated soils present? If yes, year-round? ∑ Likely _ Unlikely _ Unl
	Yes _ No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Wetland 15 located w/m a disturbed periodically
	maintained transmission in 200
	Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $\times > 20$
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	Norl
	(*) Denotes reference to the Supplemental Information document that provides more details on this particular question.
	² Each wetland must have a separate Phase 1 habitat assessment data form completed.

in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-	W	.017	•
welland ib.		- 4		

Yes _ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Without is whin a periodically maintained transmission like Row.

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Herbicid Spraying, periodic cultury woody vegetation

Soil types present*:

Ho - Holly silt loam

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth	
PEM Portion of Wetland:	100%.	None	R/A in.	N/A in.	
PSS Portion of Wetland:			in.	in,	
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>	
POW/PUB Portion of Wet	land:		<u>in.</u>	<u>in.</u>	

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzain	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Salidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedg Cyperus esculentu
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocorpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundingcea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: _/NC-W-017
Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
The wetland is located whin a periodially maintained transmission he
Row. wetland is situated along thoodplain and at toc-of-slope
withand is asso. w/ seasonal discharge at the too-of-slope
Row. wetland is situated along thoodplain and at toc-ot-slope withand is asso. w/ seasonal discharge at the too-ot-slope und contains soft saturated unditions but no mucky substante.
How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
None of it All of it Part of it (acres or% of the off-site portion)
Is there potential bog turtle habitat within 300 feet*? \succeq Yes No Unk Habitat off-site? \succeq Yes No Unk
If yes, how did you conclude this? The Phase I survey he this project iduthed
PBTP w/m The Project study area.
Phase I surveys the previous projects have identified PBTH w/n The watersled
Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
Yes
but lacks a persistant spring had mydridagy and deep
mucky substrate
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is

^{**}Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in *Guidelines for Bog Turtle Surveys* for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in *Guidelines for Bog Turtle Surveys*).

Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document.	PNDI # (for PA): 7/9/37
Property/Project Name Indiantown Gap Nutronal Cemetary Expunsion Proj	ect
Coordinates 40. 4246 29, -76. 567777 Project Type Expanding	
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.	
County/Townshin/Municipality Egst Hanover + Union Trup Lebanon Co	
Lead Surveyor Bridge Thompson Affiliation The	mpson Environmalal
Other Assistants Present	
Date of Survey 10/08/2020 Time In 1500 Time Out 1530	Air Temp F °C°
Last Precipitation < 24 hours 1-7 days × > 1 week unknown Drought conditions?	
Drought Index*1 (Circle): none D0 (D1) D2 D3 D4 Wetland Photos Taken X Yes No	
Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other so	easonal conditions observed):
The region is expenencing very dry drught like condition	1915
Wetland Size <u>0.24</u> acres, if known #Wetlands w/in Project Area ² <u>/8</u>	
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4	5+ 10+
Estimate % Canopy Cover*3 0%X < 5 6-20 21-40 41-60 > 60	_
Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent go	eneral wetland information
★ Springs/Seeps Springhouse ★ Trib/Stream Pond ★ Stormwater Iron Bactor	
Water Visible on Surface	
Small Puddles/Depressions (inches deep) \(\subseteq \subseteq \text{Saturated soils present? If yes, year-ro} \)	
Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drain ponds roads heaver activity)? ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	nages, berms, culverts, fill material,
periodially maintained roadside ditch.	spund and
personially maintuised road side aitch.	
Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $\times > 20$	
For ditches that may be present, is there bog turtle habitat? If yes, describe:	
None	
1 (*) Denotes reference to the Supplemental Information document that provides more details on this	particular question

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W	-018
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× Yes _ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Periodically mowed/maintained roadside ditch.

Internation

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

CmB- comby sitt loam 3 to 8 percent slopes

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100-1	Nine	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Common Reed Alnus spp. Phragmites australis		Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.	
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa	
American Elm Duck Potato Ulmus americana Sagittaria latifolia		Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Buirush or Woolgrass Scirpus cyperinus	
Arrowhead Eastern Red Cedar Sagittaria latifolia Juniperus virginiana		Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus	
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	(bulrush)	
Cattail Typha spp	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	, Tussock Sedge Carex stricta		
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.		
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra		

Notes on additional plant species (e.g., sedge, rush, grass, shrub, tree species):

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: <u>/NC- W-018</u>
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): The wetland is located on a slight hill slope that extends to a constructed roadside ditch
Landscape Info	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? ZYes No Unk Habitat off-site? ZYes No Unk
	If yes, how did you conclude this? The Phase I Survey for this project identified
/	anosel surveys for previous Projects identified PBTH who the wateshed
Species	Were any bog turtles observed? Yes No If yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
=	Yes ∠ No Unsure The hydrology criterion for bog turtle habitat is metYes ∠ No Unsure The soils criterion for bog turtle habitat is metYes No Unsure The vegetation criterion for bog turtle habitat is metYes ∠ No Unsure This wetland HAS potential bog turtle habitat (fair to good quality)Yes ∠ No Unsure This wetland HAS potential bog turtle habitat (low to very low quality)Yes ∠ No Unsure This wetland HAS potential bog turtle habitat (low to very low quality) This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.
Lead Surveyor Opinion	Spring fed and lock not contain any days mucky substrate.
Lead Su	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridge-Thompson Signature Byll Jan Date 10/08/2020
	Contact Information 5thompson @ Thompson csp. com 717-609-3301
1	**Important** Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in Guidelines for Bog Turtle Surveys for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in Guidelines for Bog Turtle Surveys).

Appendix C Photo Log

Date:

1

10/08/20

Feature ID:

Wetland INC W-001

Direction:

Northwest

Description:

View of wetland INC-W-001 showing vegetative conditions.



Photograph:

Date:

2

10/08/20

Feature ID:

Wetland INC-W-002

Direction:

Southwest

Description:

View of wetland INC-W-002 showing the vegetative structure.



Date:

3

10/08/20

Feature ID:

Wetland INC-W-003

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-003 located wooded swale.



Photograph:

Date:

4

10/08/20

Feature ID:

Wetland INC-W-004

Direction:

South

Description:

View of the vegetative conditions in wetland INC-W-004.



Date:

5

10/08/20

Feature ID:

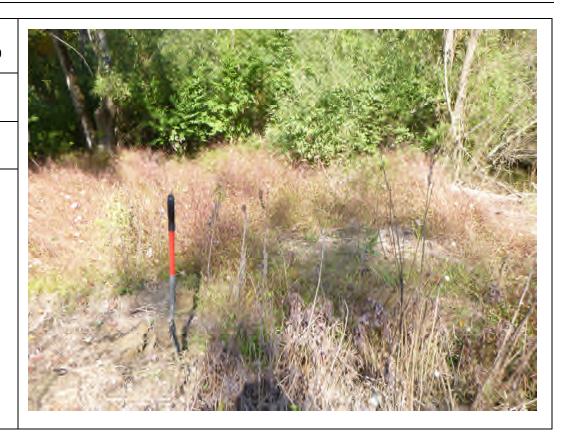
Wetland INC-W-005

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-005.



Photograph:

Date:

6

10/08/20

Feature ID:

Wetland INC-W-006

Direction:

South

Description:

View of wetland INC-W-006 located in a wooded/shrubby lot at the origin of a small intermittent watercourse.



Date:

7

10/08/20

Feature ID:

Wetland INC-W-007

Direction:

West

Description:

View of the vegetative conditions in wetland INC-W-007.



Photograph:

Date:

8

10/08/20

Feature ID:

Wetland INC-W-008

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-008.



9

10/08/20

Date:

Feature ID:

Wetland INC-W-009

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-009.



Photograph: Date:

10

10/08/20

Feature ID:

Wetland INC-W-010

Direction:

South

Description:

View of the vegetative conditions in wetland INC-W-010.



Date:

11

10/08/20

Feature ID:

Wetland INC-W-011

Direction:

North

Description:

View of wetland INC- W-011.



Photograph:

Date:

12

10/08/20

Feature ID:

Wetland INC-W-012

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-012.



Date:

13

10/08/20

Feature ID:

Wetland INC-W-013

Direction:

South

Description:

View of wetland INC-W-013.



Photograph: Date:

14

10/08/20

Feature ID:

Wetland INC-W-014

Direction:

West

Description:

View of the vegetative conditions in wetland INC-W-014.



15

10/08/20

Date:

Feature ID:

Wetland INC-W-015

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-015.



Photograph:

Date:

16

10/08/20

Feature ID:

Wetland INC-W-016

Direction:

South

Description:

View of wetland INC-W-016.



Date:

17

10/08/20

Feature ID:

Wetland INC-W-017

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-017.



Photograph: [

Date:

18

10/08/20

Feature ID:

Wetland INC-W-018

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-018.



Appendix D PNDI Receipt

1. PROJECT INFORMATION

Project Name: Indiantown Gap National Cemetery

Date of Review: 9/28/2020 11:42:33 AM

Project Category: Development, Additions/maintenance to existing development facilities

Project Area: 130.95 acres

County(s): **Lebanon**

Township/Municipality(s): EAST HANOVER; UNION

ZIP Code: 17003

Quadrangle Name(s): INDIANTOWN GAP

Watersheds HUC 8: **Lower Susquehanna-Swatara** Watersheds HUC 12: **Reeds Run-Swatara Creek**

Decimal Degrees: 40.423356, -76.560188

Degrees Minutes Seconds: 40° 25' 24.819" N, 76° 33' 36.6756" W

This is a draft receipt for information only. It has not been submitted to jurisdictional agencies for review.

2. SEARCH RESULTS

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

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Indiantown Gap National Cemetery

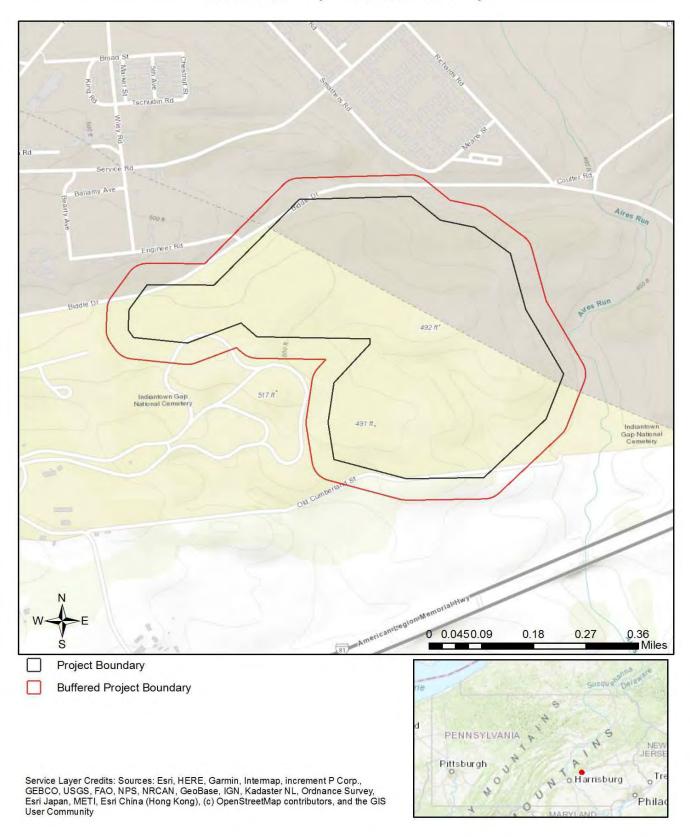


Project Boundary

Buffered Project Boundary

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

Indiantown Gap National Cemetery



RESPONSE TO QUESTION(S) ASKED

Q1: Which of the following closest describes the proposed project?

Your answer is: No groundwater extraction (e.g., water supply well, well for irrigation, groundwater pumping to facilitate mining, pump-and-treat operation) is proposed in order to implement or support this project.

Q2: Are there any perennial or intermittent waterways (rivers, streams, creeks, tributaries) in or near the project area, or on the land parcel?

Your answer is: Yes

Q3: Describe how wastewater (effluent) will be handled (select one). For the purpose of this question, wastewater/effluent does not include stormwater runoff. If the project involves solely the renewal or modification of an existing discharge permit (e.g., NPDES permit), select from options 3, 4, 5, or 6 below.

Your answer is: This project/activity (including construction, maintenance, and operation of the completed project) will not generate any wastewater/effluent; therefore, none will be discharged.

Q4: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.

Your answer is: The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.

3. AGENCY COMMENTS

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

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

PA Game Commission

RESPONSE:

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

PA Department of Conservation and Natural Resources RESPONSE:

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

PA Fish and Boat Commission

RESPONSE:

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

Project Search ID: PNDI-719137

Pennsylvania Department of Conservation and Natural Resources

Project Search ID: PNDI-719137

PNDI Receipt: project_receipt_indiantown_gap_national_c_719137_DRAFT_1.pdf

U.S. Fish and Wildlife Service

RESPONSE:

Information Reguest: Conduct a Bog Turtle Habitat (Phase 1) Survey in accordance with USFWS Guidelines for Bog Turtle Surveys (April 2020). Evaluate all wetlands within 300 feet of the project area, which includes all areas that will be impacted by earth disturbance or project features (e.g., roads, structures, utility lines, lawns, detention basins, staging areas, etc.). IF THE PHASE 1 SURVEY IS DONE BY A QUALIFIED BOG TURTLE SURVEYOR (see https://www.fws.gov/northeast/pafo/endangered/surveys.html): 1) Send positive results to USFWS for concurrence, along with a project description documenting how impacts will be avoided. OR, conduct a Phase 2 survey and send Phase 1 and 2 results to USFWS for concurrence. 2) Send a courtesy copy of negative results to USFWS (label as "Negative Phase 1 Survey Results by Qualified Bog Turtle Surveyor: USFWS Courtesy Copy"). USFWS approval of negative results is not necessary when a qualified surveyor does the survey in full accordance with USFWS guidelines. IF THE PHASE 1 SURVEY IS NOT DONE BY A QUALIFIED SURVEYOR: Send ALL Phase 1 results to USFWS for concurrence, and if potential habitat is found, also send a project description documenting how impacts will be avoided. As a qualified bog turtle surveyor, I (name) certify that I conducted a Phase 1 survey of all wetlands in and within 300 feet of the project area on (date) and determined that bog turtle habitat is absent. (Signature) Avoidance Measure: Do not conduct this project/activity within 50 feet of any streams, rivers, creeks, or tributaries. This includes both perennial and intermittent waterways. As the project proponent or applicant, I certify that I will implement the above Avoidance Measure: (Signature)

SPECIAL NOTE: If you agree to implement the above Avoidance Measure and if applicable, any Information Requests, no further coordination with this agency regarding threatened and endangered species and/or special concern species and resources is required. If you are not able to comply with the Avoidance Measures, you are required to coordinate with this agency - please send project information to this agency for review (see "What to Send" section).

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).

Check-list of Minimum Materials to be submitted:

____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.

____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)

In addition to the materials listed above, USFWS REQUIRES the following

SIGNED copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.

____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)

____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

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



5. ADDITIONAL INFORMATION

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

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



ATTACHMENT 2

Phase 2 Bog Turtle Presence/Probable Absence Survey Report

Indiantown Gap National Cemetery Phase 5 Expansion Project

PHASE 2 BOG TURTLE PRESENCE/ PROBABLE ABSENCE SURVEY REPORT



PREPARED BY:

THOMPSON ENVIRONMENTAL SURVEYS & PERMITTING, LLC.

FOR:

MABBETT & ASSOCIATES, INC.,

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FIGURES

FIGURE 1 PROJECT LOCATION MAP

FIGURE 2 BOG TURTLE HABITAT MAP

APPENDICIES

APPENDIX A PHOTOGRAPHIC LOG



SECTION 1 INTRODUCTION

1.1 Introduction

On November 4, 1997 under the provisions of the Endangered Species Act of 1973 the United States Fish and Wildlife Service (USFWS) listed the bog turtle (Glyptemys muhlenbergii), as threatened. In Pennsylvania pursuant to Pennsylvania Code, Title 58, Chapter 75: Endangered Species the bog turtle is listed as endangered. Due to the bog turtles' federal and state protected status, any project in Pennsylvania that may potentially impact wetlands or waters in watersheds listed as known or likely occurrence of bog turtles will require a Phase 1 Bog Turtle Habitat Survey (Phase 1). The results of the Phase 1 habitat survey will determine if potential bog turtle habitat is in or within proximity to the proposed impacts for the project. If potential bog turtle habitat is identified and direct or indirect impacts are unavoidable a Phase 2 Presence/Probable Absence Bog Turtle Survey (Phase 2) is required to determine the presence or probable absence of bog turtles within the evaluated wetland. The time and duration of the Phase 2 surveys is dependent on the identified average of designated survey area (DSA) within the wetland. DSA can be defined as the portion of the wetland that contains the appropriate hydrology and soil substrate conditions to support bog turtles. In addition to a Phase 2 bog turtle survey, wetlands identified as potential bog turtle habitat that contain greater than 2 acres (ac) of DSA or wetlands that contain difficult survey conditions may require a Phase 3 Bog Turtle Trapping Survey (Phase 3) depending on USFWS and Pennsylvania Fish and Boat Commission (PFBC) review.

On October 7, 2021 Thompson Environmental Surveys & Permitting (TES&P) performed a Phase 1 bog turtle habitat survey for Mabbett & Associates, Inc (Mabbett) to support the proposed Phase 5 Indiantown Gap National Cemetery Expansion Project (Project). The results of this investigation revealed one wetland within the Project study area that met the criteria to be considered potential bog turtle habitat (PBTH). The results of the Phase 1 bog turtle habitat survey were reported to Mabbett in May 2021. While the proposed Project will require minimal land disturbances and no aquatic resource impacts are anticipated due to the limited timeframe available to conduct Phase 2 bog turtle surveys in the 2021 survey season Mabbett elected to conduct a Phase 2 bog turtle survey for this wetland prior to receiving concurrence on the Phase 1 survey results. TES&P's USFWS/PFBC Recognized Qualified Bog Turtle Surveyor (RQBTS) David Brotherton conducted the Phase 2 survey under the purview of his PFBC Type III, Scientific Collectors Permit (Permit Number 2021-03-0302), and associated Chapter 75.4 Special Permit for Collection of Threatened and Endangered Species. completed the Phase 2 bog turtle survey in April and May 2021. This report documents the results and conclusions of the Phase 2 bog turtle survey conducted for the Project.

1.2 PROJECT DESCRIPTION

The Project is located along the south side of Biddle Drive along the northern border of the Indiantown Gap National Cemetery in East Hanover and Union Townships, Lebanon County, Pennsylvania (Figure 1). The coordinates for the approximate Project center are 40.42484° and -76.56614°. The Project is located on the United States Geological Survey (USGS) Indiantown Gap, PA 7.5-minute topographical quadrangle (USGS, 2013). Land cover within the Project area consists of mowed maintained open areas, forest, wetlands, watercourses, and floodplain/riparian areas. Land uses in the vicinity of the Project consist of



developed military training ranges and facilities, cemetery, transmission line right-of-way, and secondary roadways. The Project drains south via an unnamed tributary (UNT) to Aires Run which is located within the Susquehanna River Basin.

SECTION 2 SURVEY METHODS

2.1 Phase 2 Survey Methodology

This section discusses the methods used to complete the Phase 2 bog turtle survey described within this report. During the 2021 Phase 2 bog turtle survey season, TES&P biologists conducted Phase 2 bog turtle surveys in one wetland (Wetland INC-W-002) identified as PBTH within the Project area. A total of 0.12-acres of DSA were surveyed (**Figure 2**). The Phase 2 bog turtle surveys in accordance with the USFWS *Guidelines for Bog Turtle Surveys* (Revised April 2020).

For wetlands designated as PBTH, TES&P biologists identified areas of DSA and estimated the approximate acreage. The Phase 2 survey consisted of four site visits to the identified PBTH wetlands with four to six person hours of survey effort conducted per acre of DSA. The Phase 2 survey was performed between April 15 and June 15 during days with suitable weather conditions and at least two survey visits were conducted in May.

Survey methods included random opportunistic sampling and a modified grid search. Initially, the entire DSA was quietly walked through and probed with hands and probing sticks, while visually searching for basking or foraging turtles. While conducting the walk through a visual assessment of the wetland was conducted to identify areas that appeared to contain the best habitat conditions, typically containing all three bog turtle habitat characteristics: spring fed hydrology with subsurface flow, tussock vegetative structure, and mucky soils. Following the initial walk-through, the areas of best habitat in the DSA were further investigated by lifting and looking under dead or loose vegetation covering the ground surface, muddling with hands in the muck and under vegetation while feeling for submerged turtles, and probing deep subsurface soil pipes with hands. A modified grid-like fashion and random opportunistic survey method ensured the entire DSA was thoroughly surveyed. Following a thorough search of the DSA, a final walk through of the entire DSA was again conducted to visually search for turtles that may have moved away from the areas where the intensive search was being conducted. During the final walk-through, vegetation was lifted and deep mucky areas were probed using a probing stick and hands.

The TES&P biologist recorded the date, number of survey crew members, total survey time and the current weather conditions including; air temperature (in the shade) at the start and end of the survey, precipitation and percent cloud cover. Additionally, all herptiles species and the number encountered during the surveys were recorded. Representative photos of the wetlands, DSA, and herptiles were taken and are located in **Appendix A**. While no bog turtles were encountered during the surveys, had they been, the turtles would have been processed on site following USFWS guidelines and immediately released in the exact location from where they were found and the Phase 2 survey would have concluded.



SECTION 3 WETLAND DESCRIPTIONS

3.1 WETLAND DESCRIPTIONS

Brief descriptions of the wetlands and DSAs investigated during the Phase 2 bog turtle survey are below including; wetland size, location within the landscape, surrounding land use, wetland conditions, and acreage of DSA. **Table 1** provides a summary of the wetland characteristics.

Wetland INC-W-002 (PEM)

Wetland INC-W-002 is an approximately 0.52-acre palustrine emergent (PEM) resource situated in a depression at a toe slope that is the origin of multiple intermittent channels. The wetland is located on the south side of Biddle Drive and along the northern border of Indiantown Gap National Cemetery and is within 300-feet of the proposed limits of disturbance for the proposed Phase 5 expansion. The primary source of wetland hydrology is provided by a seasonal ground water spring seeps and seasonally high groundwater table. Portions of the wetland receive hydrology from surface water runoff from a roadside culvert and stormwater discharge from the cemetery, located upslope from the wetland. The dominant vegetation in the wetland included sensitive fern (Onoclea sensibilis), broadleaf cattail (Typha latifolia), rice cutgrass (Leersia oryzoides), fox sedge (Carex vulpinoidea), jewelweed (Impatiens capensis), black willow (Salix nigra) and silky dogwood (Cornus amomum). The wetland soil substrate consists of silt loam with a mucky substrate that can be probed to depths of 4 to 10 inches. The wetland contains vegetative species common to bog turtle habitat and the vegetative structure and micro-habitat conditions are consistent with the conditions commonly observed in bog turtle habitat including rivulets and pockets of standing surface water. Due to the presence of mucky soil conditions, spring-fed hydrology, and a vegetative structure with micro-habitat conditions Wetland INC-W-002 is considered PBTH. Approximately 0.12-acre of DSA was identified in the wetland. The location of the wetland and respective DSA is depicted on Figure 2. A summary of the wetland characteristics is provided in Table 1.

Table 1- Wetland Identification Table

Wetland ID	Size acres) Total DSA (acres)		Wetland Types and Percentage ¹	Extent of Mucky soils (<3"deep)	DSA	Latitude / Longitude	Bog Turtles Found ²
INC-W-002 (DSA 1)	0.52	0.12	PEM – 100%	PEM - 25%	1	40.424842°, -76.566119°	No

^{1.} PEM-Palustrine emergent, PFO-Palustrine forested PSS-Palustrine scrub-shrub, PUB-Palustrine unconsolidated bottom.

^{2.} Y-Yes, N-No, UK-unknown.



SECTION 4 RESULTS

4.1 Phase 2 Results

TES&P conducted the Phase 2 bog turtle surveys for Wetland INC-W-002 within a 0.12-acre area of DSA within the Project Area. A description of the survey results for the wetland are below. TES&P biologist identified common herpetological species during the Phase 2 survey. The photolog in **Appendix A** contains representative photographs of the species observed. **Table 2** provides a summary of the herpetofauna observed during the survey efforts. **Table 3** summarizes the dates of surveys, number of surveyors, survey effort, weather conditions, and species observed.

Wetland INC-W-002

The TES&P biologist conducted four Phase 2 surveys with a total of 34.44 survey hours per acre for the 0.12-acres of DSA in Wetland INC-W-002. Biologists encountered a few common herpetofauna while conducting the surveys; however, no bog turtles, or signs of bog turtle activity (tracks, shells, or nests) were observed within the identified DSAs during the 2021 survey efforts.

Table 2: Common and Scientific Names of Herpetofauna Observed during the Phase 2 Surveys

Common Name	Scientific Name		
Green Frog	Lithobates clamitans		
Northern Dusky Salamander	Desmognathus fuscus		
Eastern Box Turtle	Terrapene carolina		
Grey Treefrog	Hyla versicolor		



Table 3: Phase 2 Bog Turtle Survey Results

Wetland Name	Survey Date	Time (Start - Stop)	Search-Effort (Hours)	Number of Surveyors	DSA Size (acres)	Total Hours of Search-Effort (per- acre) ¹	Weather Survey Start - Survey Stop Cloud Cover estimate	No. of Bog Turtles Found	Other Species observed
	4/28/2021	01:10 - 02:10	1.00	1		8.33	Start - 86° F with 15% cloud cover, wind 0 mph Stop - 86° F with 10% cloud cover, wind 0 mph	0	Green Frog (1) N. Dusky Salamander (1)
Wetland INC-W-002	5/04/2021	12:58 – 02:02	1.07	1	0.12	8.89	Start - 78° F with 20% cloud cover, wind 1 mph Stop - 85° F with 20% cloud cover, wind 1 mph	0	Green Frog (1) E. Box Turtle (3) Gray Treefrog (calling)
	5/12/2021	01:35 – 02:35	1.00	1		8.33	Start - 65° F with 10% cloud cover, wind 3 mph Stop - 67° F with 10% cloud cover, wind 1 mph	0	none
	05/19/2021	11:56 – 01:00	1.07	1		8.89	Start - 81° F with 0% cloud cover, wind 1 mph Stop - 82° F with 0% cloud cover, wind 0 mph	0	Green Frogs (2)

¹ Total Hours of Search Effort Per Acre = Search Effort x Number of Surveyors / DSA Size



SECTION 5 CONCLUSIONS

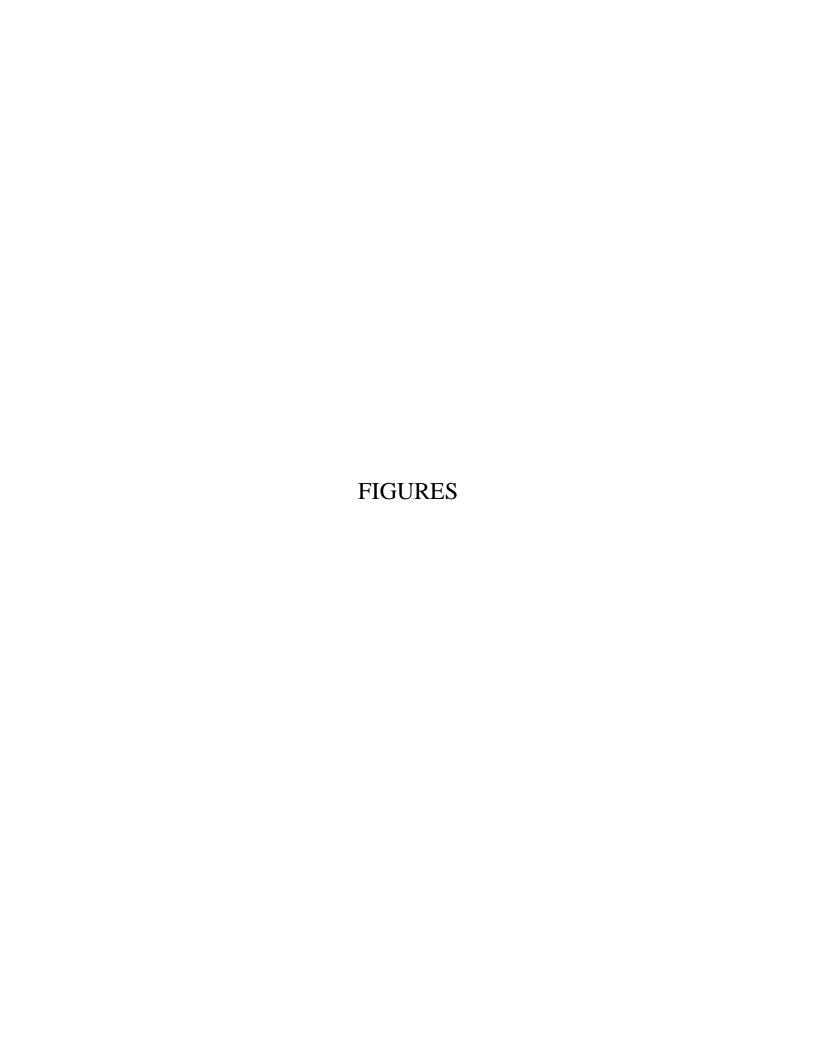
5.0 PROJECT RESULTS AND CONCLUSIONS

During the 2021 bog turtle survey season, TES&P conducted Phase 2 bog turtle surveys for Wetland INC-W-002 identified as PBTH for the Indiantown Gap National Cemetery Expansion Project. No bog turtles, or signs of bog turtle activity (tracks, shells, or nests) were identified during the 2021 survey efforts. Therefore, based on the Phase 2 bog turtle survey results, TES&P is confident that the probable absence of the species for the surveyed wetlands has been determined.



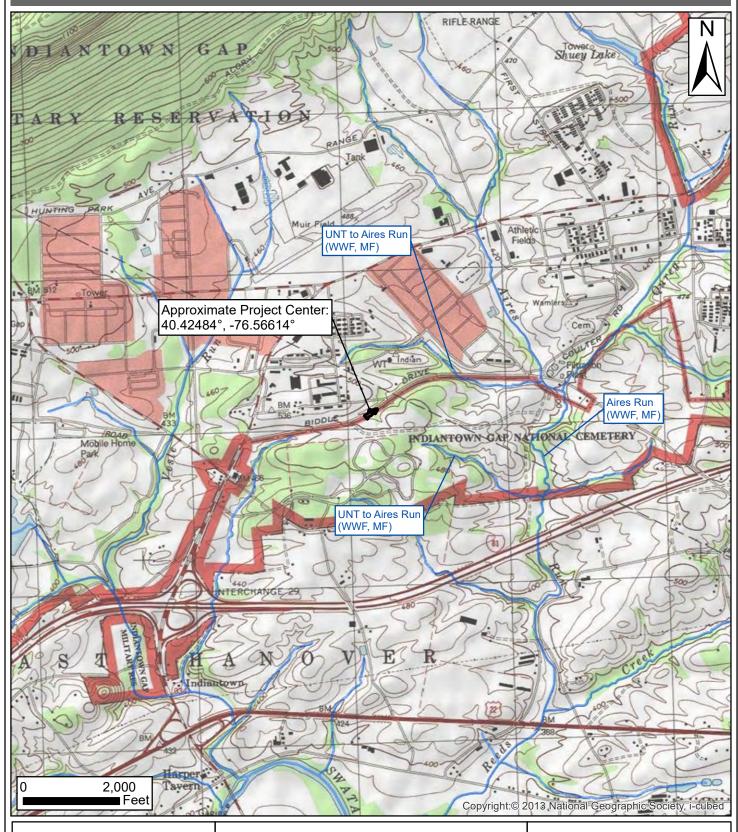
SECTION 6 REFERENCES

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. Roe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States, FWS/OBS-79/31*. USFWS, Office of Biological Services, Washington, District of Columbia.
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- U.S. Army Corps of Engineers (USACE). 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.
- U.S. Fish and Wildlife Service (USFWS). 2001. *Bog Turtle (Clemmys muhlenbergii), Northern Population Recovery Plan.* Hadley, Massachusetts.
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INDIANTOWN GAP NATIONAL CEMETERY

Figure 1: Location Map





USGS 7.5' Quadrangle: Indiantown Gap
East Hanover Township
Lebanon County, Pennsylvania

Mabbett[®]

Date: 6/20/2021 | Created By: CMG

Appendix A
Photographic log

Date:

1

04/28/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

East

Description:

View of open emergent portion of Wetland INC-W-002 in DSA 1 with mucky substrates and several spring seeps on the 1st Phase 2 survey visit.



Photograph:

Date:

2

04/28/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

West

Description:

View of open emergent area with muck and seeps in Wetland INC-W-002 (DSA 1) dominated by sensitive fern and rice cutgrass on the 1st Phase 2 survey visit.



Date:

3

05/04/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

East

Description:

View of open emergent area with muck and seeps in Wetland INC-W-002 (DSA 1) dominated by sensitive fern, rice cutgrass and soft rush on the 2nd Phase 2 survey visit.



Photograph:

Date:

4

05/12/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

East

Description:

View of open emergent area with muck and seeps in Wetland INC-W-002 (DSA 1) dominated by sensitive fern, rice cutgrass and soft rush on the 3rd Phase 2 survey visit.



Date:

5

05/12/21

Feature ID:

Wetland INC-W-002

Direction:

West

Description:

View of emergent area in the western portion of Wetland INC-W-002 (DSA) dominated by cattail, rice cutgrass and sensitive fern on the 3rd Phase 2 survey visit.



Photograph: Date:

6

05/19/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

East

Description:

View of emergent area with muck and seeps in Wetland INC-W-002 (DSA 1) dominated by sensitive fern, rice cutgrass and soft rush on the 4th Phase 2 survey visit.



7

Date:

05/190/21

Feature ID:

Wetland INC-W-002 (DSA)

Direction:

West

Description:

View of emergent area with mucky soils and seeps in Wetland INC-W-002 (DSA 1) dominated by sensitive fern and rice cutgrass on the 4th Phase 2 survey visit.



Photograph:

Date:

8

05/04/21

Feature ID:

Eastern Box Turtle (female)

Direction:

NA

Description:

Photo of Eastern Box Turtle found in the western portion of Wetland INC-W-002 during the surveys.



Photograph: Date:

8

05/04/21

Feature ID:

Eastern Box Turtle (juvenile)

Direction:

NA

Description:

Photo of Eastern Box Turtle found in the western portion of Wetland INC-W-002 during the surveys.



Photograph: Date:

8

05/04/21

Feature ID:

Eastern Box Turtle (male)

Direction:

NA

Description:

Photo of Eastern Box Turtle found in the western portion of Wetland INC-W-002 during the surveys.



ATTACHMENT 3

Additional Project Area Phase 1 Bog Turtle Habitat Survey



July 22, 2021

U.S. Fish and Wildlife Service Pennsylvania Field Office 110 Radnor Rd #101, State College, PA 16801

RE: (POSITIVE) Phase 1 Bog Turtle Habitat Survey Conducted by a Recognized Qualified Bog Turtle Surveyor Indiantown Gap National Cemetery Phase 5 Expansion Project, Additional Project Areas

East Hanover Township, Lebanon County, Pennsylvania

PNDI # 737860

To Whom it May Concern:

Thompson Environmental Surveys & Permitting, LLC. (TES&P) recently conducted Phase 1 Bog Turtle (*Glyptemys muhlenbergii*) Habitat Surveys (Phase 1) for Mabbett & Associates, Inc. (Mabbett) on behalf of the U.S Department of Veterans Affairs (VA). The Phase 1 survey covered Additional Project Areas identified in June 2021 for the Indiantown Gap National Cemetery (IGNC) Phase 5 Expansion Project (Project). The purpose of the Project is to expand the existing cemetery to include additional burial sites and to upgrade and maintain existing cemetery walkways, monuments, and structures.

PROJECT BACKGROUND

The initial IGNC Project encompasses areas located east of the existing developed cemetery boundary in a non-developed portion of the IGNC Property (**Figure 1**).

Phase 1 Bog Turtle Habitat Assessment were completed for this initial Project Area in 2020. Phase 2 Presence/Absence Surveys (Phase 2) were completed for one wetland identified as potential bog turtle habitat in the 2021 Phase 2 bog turtle survey season. Reports were completed to document the results of these surveys and are included in a separate submission. However, due to recently proposed design refinements an Additional Project Area is required (**Figure 2**). This report discusses the results of Phase 1 surveys conducted for this Additional Project Area.

The Additional Project Area is located in East Hanover, Township, Lebanon County, Pennsylvania. The coordinates for the approximate Additional Project Area center are 40.42033° and -76.568297°. The Additional Project Area is located on the United States Geological Survey (USGS) Indiantown Gap, PA 7.5-minute topographical quadrangle (USGS, 2013). Land cover within proximity to the Additional Project Area consists of open land and small wooded lots. Land use in the vicinity of the Additional Project Area consists of developed and maintained cemetery grounds, visitor centers and monuments, and paved and maintained walkways and secondary roadways. The Additional Project Area drains east to an unnamed tributary (UNT) to Aires Run and west to an UNT to Indiantown Run both of which are located within the Swatara Creek watershed and Lower Susquehanna River Basin.

The Phase 1 bog turtle habitat survey described herein conforms to the survey methodology outlined in the United States Fish and Wildlife Service (USFWS) guidelines for conducting Phase 1 Bog Turtle Habitat Surveys pursuant to the Bog Turtle Recovery Plan (USFWS, 2001) and Guidelines for Bog Turtle Surveys (USFWS, Revised April 2020). This letter report discusses the results of the Phase 1 bog turtle habitat survey.

REGULATORY BACKGROUND

Federal law, specifically the Endangered Species Act (ESA) of 1973, mandates that all federal agencies undertaking projects that have an effect or have the potential to have an effect on threatened, endangered, or candidate species, be it through direct or indirect jurisdiction, such as a federal license or permit, must undergo Section 7 ESA Review. The Section 7 consultation process requires that federal agencies, or those entities seeking a federal license or permit, consider how their undertakings may affect endangered species and allow the USFWS or National Marine Fisheries Service (NMFS), if applicable, the opportunity to comment on such undertakings.

The PA Natural Diversity Inventory (PNDI) Environmental Review receipt (PNDI # 737860) for the Project was updated on July 9, 2021 to include the Additional Project Area. Based on the PNDI response receipt it was anticipated that there may be potential impacts to bog turtle a federally threatened and state endangered special. As, such a Phase 1 Bog Turtle habitat Survey was completed for the Project. No known impacts to threatened and endangered and/or special concerns species and resources under jurisdiction of the Pennsylvania Game Commission, PA Department of Conservation and Natural Resources, or Pennsylvania Fish and Boat Commission were identified, therefore no additional communication with those respective agencies is required. A copy of the PNDI receipt is provided as (Attachment A).

SURVEY METHODOLOGY

On June 10, 2021 TES&P Biologist, Bridger Thompson, a USFWS and Pennsylvania Fish and Boat Commission (PFBC) Recognized Qualified Bog Turtle Surveyor (RQBTS) conducted Phase 1 bog turtle habitat surveys for the above referenced Additional Project Area to identify potential bog turtle habitat (PBTH). Bog turtle habitat is recognized by three criteria: suitable hydrology including spring seeps, shallow surface water, persistently saturated soils, subsurface flow, rivulets, suitable soils (including a bottom substrate of soft muck, a critical criterion), suitable vegetative structure (including dominant vegetation of low grasses and sedges, reed canary grass, cattail, rice cut grass, phragmites, or skunk cabbage), and possibly a scrub-shrub wetland component with a relatively open canopy. The Phase 1 bog turtle habitat survey included all wetlands identified by TES&P within the Phase 1 Study Areas for the Additional Project Area(Figure 3).

In June 2021 Mabbett provided TES&P with mapping depicting the boundaries of the Additional Project Area and proposed limits-of-disturbance (LOD) for the Additional Project Area. Prior to conducting an on-site Phase 1 survey, TES&P conducted a desktop review for the Additional Project Area and reviewed historic aerial imagery for the Project. During onsite inspection TES&P surveyed all area within 300-feet of the proposed LOD and Additional Project Area for wetland resources. All wetlands observed were assessed in their entirety for the conditions required to be considered PBTH. If a wetland was determined to be PBTH the Designated Survey Area (DSA) within the wetland was determined. DSA is defined as all areas of the wetland where soft muck-like soils are present. Information recorded for the habitat assessment for each wetland is presented on the USFWS Phase 1 Bog Turtle Habitat Survey Field Forms for the Northern Population Range (Revised April 2020), including dominant plant species, substrate characteristics, and hydrology (Attachment B). Representative conditions within Study Areas and the wetlands were photographed, and are included in the attached photo log (Attachment C).



HABITAT ASSESSMENT RESULTS

During on-site surveys, TES&P identified a total of nineteen wetlands within 300-feet of the proposed LOD for the Additional Project Area. For the purposes of this report the investigated wetlands are identified as (INC-W-021 through INC-W-039). The following is a brief description of the investigated resources and their potential to be considered bog turtle habitat.

Wetland INC-W-021

Wetland INC-W-021 is approximately 2.21-acre palustrine emergent (PEM) resource located in the southeast corner of the Additional Project Area. The wetland situated in a wooded shrubby gully that extends along the floodplain of Aires Run. The primary source of wetland hydrology is provided by seasonal groundwater discharge that originates along the toe-of-slope of the gully and a seasonal ground water connection to Aires Run. Additional hydrology is attributed to seasonal flood flow from Aires Run. The dominant vegetation in the wetland is composed of reed canary grass (*Phalaris arundinacea*) and Japanese stilt grass (*Microstegium vimineum*). The wetland contained pockets of soft saturated soil substrate associated with the seasonal groundwater discharge and small pockets of standing surface water. However, no mucky substrate was observed. The wetland contains vegetative species common to bog turtle habitat but lacks the vegetative structure and micro-habitat conditions to be considered potential bog turtle habitat. Due to the lack of mucky soil conditions, persistent spring-fed hydrology, and a vegetative structure with micro-habitat conditions, and the evidence of seasonal flooding Wetland INC-W-021 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-022

Wetland INC-W-022 is approximately 0.49-acre PEM resource located on the eastern edge of the Additional Project Area east of Indiantown Road. The wetland is situated in wooded shrubby area that follows the floodplain of Aires Run. The wetland extends along a small high flow channel of Aires Run that contains pockets of perched surface water from seasonal flooding. The primary source of wetland hydrology is provided by seasonal flood flow from Aires Run. The majority of the wetland is non-vegetated but is bordered by skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*), and fringe sedge (*Carex crinita*). The wetland contained areas of soft soil substrate associated with the perched surface water and collected organic debris however, no mucky substrate was observed. The wetland micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the evidence of seasonal flooding, lack of mucky soil conditions, or a persistent spring-fed hydrology, and lack of a vegetative structure with micro-habitat conditions Wetland INC-W-022 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-023

Wetland INC-W-023 is approximately 0.03-acre PEM resource located in the southeast corner of the existing cemetery grounds. The wetland is situated in a man-made storm water swale in a mowed and maintained area of the cemetery. The primary source of wetland hydrology is provided by seasonal groundwater discharge that is conveyed to the swale by a concrete storm drain. The wetland vegetation is dominated by cattail (*Typha latifolia*). The wetland soil substrate contained soft areas associated with the seasonal groundwater hydrology however, no mucky deep substrate was observed. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the manmade conditions and the lack of mucky soil substrate, the lack of a persistent spring-fed hydrology, and lack of a vegetative structure with micro-habitat conditions Wetland INC-W-023 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.



Wetland INC-W-024

Wetland INC-W-024 is approximately 0.12-acre PEM resource located in the southeast portion of the Additional Project Area. The wetland is situated on the upstream side of a small bridge structure that crosses an intermittent drainage. The wetland originates from a seasonal hillslope groundwater seep within a wooded shrubby lot and extends to the floodplain of a small intermittent drainage feature. The surrounding landscape consists of mowed maintained cemetery grounds. The primary source of wetland hydrology is provided by the seasonal groundwater discharge that originates within the wooded lot and drains in a naturally depressional area towards the channel. The dominant vegetation in the wetland contained cattail, and jewelweed. The wetland soil substrate contained areas of soft soils associated with the seasonal groundwater hydrology and collected silt deposits and organic debris at the bridge abutment however, no deep mucky substrate was observed. The wetland contains vegetative species common to bog turtle habitat however, portions of the wetland have been disturbed by the bridge crossing and evidence suggests the wetland size has increased as a result of the disturbance. While the micro-habitat conditions are consistent with the conditions commonly observed in bog turtle habitat due to the evidence of historic disturbance, the lack of persistent mucky soil conditions, and the lack of a persistent spring-fed hydrology, Wetland INC-W-024 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-025

Wetland INC-W-025 is approximately 0.13-acre PEM resource located in the southeast portion of the Additional Project Area. The wetland is situated on the downstream side of a small bridge structure that crosses an intermittent drainage. The wetland originates from a persistent hillslope groundwater seep at the edge of the mowed maintained cemetery grounds and extends to the floodplain of a small intermittent drainage feature. The surrounding landscape consists of mowed maintained cemetery grounds. The primary source of wetland hydrology is provided by the persistent groundwater discharge that drains along a vegetated hillslope area towards the channel. The wetland vegetation is dominated by soft rush (Juncus effusus), sedges (Carex sp.), and jewelweed fringed by willow (Salix sp.) and silky dogwood (Cornus amonum). The wetland soil substrate contains soft areas associated with the persistent groundwater hydrology and mucky areas measuring to depth of six inches were observed. In addition to the mucky soils evidence suggests that the wetland contains sub-surface flows associated with the groundwater seeps. The wetland contains vegetative species common to bog turtle habitat and the wetland lacks the level of disturbance observed in the upstream areas. Additionally, the micro-habitat conditions are consistent with the conditions commonly observed in bog turtle habitat. Due to the presence of a persistent groundwater hydrology with sub-surface flow, the presence of persistent mucky soil conditions, and microhabitat conditions Wetland INC-W-025 is considered PBTH. Approximately 0.01-acre of DSA was identified. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table

Wetland INC-W-026

Wetland INC-W-026 is approximately 0.43-acre PEM resource located in the southeast portion of the Additional Project Area. The wetland is situated a wide flattened depressional area within a wooded/shrubby gully that conveys an intermittent drainage. The wetland originates from a persistent hillslope groundwater seeps at the edge of the mowed maintained cemetery grounds and extends to the floodplain of a small intermittent drainage feature. The surrounding landscape consists of mowed maintained cemetery grounds and the wooded/shrubby lot. The primary source of wetland hydrology is provided by the persistent groundwater discharge that drains along a vegetated hillslope area towards the channel and a piezometric water table connection with the intermittent channel. The wetland vegetation is dominated by cattail, sedges, and sweet flag (*Acorus calamus*) and is fringed by willow and silky dogwood. The wetland soil substrate contains soft areas associated with the persistent groundwater hydrology and



mucky areas measuring to depth of ten inches were observed. In addition to the mucky soils evidence suggests that the wetland contains sub-surface flows associated with the groundwater seeps and piezometric water table connection with the intermittent channel. The wetland contains vegetative species common to bog turtle habitat and the micro-habitat conditions are consistent with the conditions commonly observed in bog turtle habitat. **Due to the presence of a persistent groundwater hydrology with sub-surface flow and the persistent mucky soil conditions, and microhabitat conditions Wetland INC-W-026 is considered PBTH.** Approximately 0.10-acre of DSA was identified. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-027

Wetland INC-W-027 is approximately 0.10-acre PEM resource located in the central portion of the Additional Project Area. The wetland is situated on the downstream side of a small bridge structure that crosses an intermittent drainage. The wetland originates from seasonal hillslope groundwater seeps and extends to the floodplain of a small heavily eroded intermittent drainage feature. The surrounding landscape consists of mowed maintained cemetery grounds. The primary source of wetland hydrology is provided by the seasonal groundwater discharge that originates along the edge of the maintained areas and drains in a naturally depressional area towards the heavily eroded channel. The wetland vegetation is dominated by cattail and sweet flag fringed by willow and dogwood. The wetland soil substrate contained areas of soft soils associated with the saturated conditions however, no deep mucky substrate was observed. The wetland contains vegetative species common to bog turtle habitat however, the micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the lack of persistent mucky soil conditions, and the lack of a persistent spring-fed hydrology, Wetland INC-W-027 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-028

Wetland INC-W-028 is approximately 0.27-acre PEM resource located in the central portion of the Additional Project Area. The wetland is situated in a narrow swale that extends from the upstream side of a small bridge structure that crosses an intermittent drainage. The wetland originates at a persistent groundwater seep at the edge of the mowed maintained cemetery grounds and extends within the swale that conveys the small intermittent drainage feature. The surrounding landscape consists of mowed maintained cemetery grounds. The primary source of wetland hydrology is provided by the persistent groundwater discharge that drains along the swale. The wetland vegetation is dominated by cattail, sweet flag, soft rush, and sedges, with small pockets of willow and silky dogwood. The wetland soil substrate contains soft mucky areas associated with the persistent groundwater hydrology and mucky substrate measuring to depth of twelve inches was observed. In addition to the mucky soils evidence suggests that the wetland contains sub-surface flows associated with persistent groundwater seeps. The wetland contains vegetative species common to bog turtle habitat and the micro-habitat conditions are consistent with the conditions commonly observed in bog turtle habitat. Due to the presence of a persistent groundwater hydrology with subsurface flow and the persistent mucky soil conditions, and microhabitat conditions Wetland INC-W-**028** is considered PBTH. Approximately 0.10-acre of DSA was identified. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-029

Wetland INC-W-029 is approximately 0.25-acre PEM resource located in the central portion of the Additional Project Area. The wetland is situated in a wide depression between two small bridge structures that cross an intermittent drainage. The wetland is the downstream extent of wetland INC-W-028 and is also associated with the persistent groundwater seeps and intermittent drainage feature that is conveyed in the natural swale. The surrounding landscape consists of mowed maintained cemetery grounds. The wetland vegetation is dominated by cattail, sweet flag, soft rush, and sedges, with small pockets of willow



and silky dogwood. The wetland soil substrate contains soft mucky areas associated with the persistent groundwater hydrology and mucky substrate measuring to depth of twelve inches was observed. In addition to the mucky soils evidence suggests that the wetland contains sub-surface flows associated with persistent groundwater seeps. The wetland contains vegetative species common to bog turtle habitat and the microhabitat conditions are consistent with the conditions commonly observed in bog turtle habitat. **Due to the presence of a persistent groundwater hydrology with sub-surface flow and the persistent mucky soil conditions, and microhabitat conditions Wetland INC-W-029 is considered PBTH.** Approximately 0.10-acre of DSA was identified. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-030

Wetland INC-W-030 is approximately 0.04-acre PEM resource located in the northeast portion of the Additional Project Area. The wetland situated in a shallow depression on downslope edge of a narrow-wooded strip within the mowed and maintained cemetery grounds. The wetland extends along the shallow depression with compacted soils at the location of a seasonal ground water discharge. The primary source of wetland hydrology is provided by the seasonal groundwater discharge and surface water runoff collection in the compacted soils. The wetland vegetation is dominated by Japanese stilt grass, and bulrush (*Scirpus atrovirens*). The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-30 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-031

Wetland INC-W-031 is approximately 0.10-acre PEM resource located in the northeast portion of the Additional Project Area. The wetland situated in a shallow depression within a narrow-wooded strip in a mowed and maintained area of the cemetery grounds. The wetland extends along the shallow depression that conveys seasonal ground water discharge and stormwater water runoff from an upslope storm drain. The primary source of wetland hydrology is provided by the seasonal groundwater discharge and storm water runoff that collects in the shallow depression. The wetland vegetation is dominated by Japanese stilt grass, jewel weed, and arrow-leafed tearthumb (*Polygonum sagittatum*). The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-31 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-032

Wetland INC-W-032 is approximately 0.56-acre PEM resource located in the north central portion of the Additional Project Area. The wetland is situated in a narrow swale that extends from a mowed and maintained area of the cemetery to into a wooded shrubby lot. The wetland originates at a seasonal groundwater seep at the edge of the mowed maintained cemetery grounds and extends within the swale that conveys a small heavily eroded intermittent drainage feature. The primary source of wetland hydrology is provided by the seasonal groundwater discharge that drains along the swale with contribution from additional groundwater seeps that originate within the wooded lot. While the wetland does contain some evidence of sub-surface flows, due to the heavily eroded condition of the intermittent channel the wetland soils are not persistently saturated and no mucky conditions were observed. The wetland vegetation is dominated by cattail, sweet flag, soft rush, sedges, and Japanese stilt grass. The wetland contains vegetative



species common to bog turtle habitat however, the micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the lack of persistent mucky soil conditions, and the lack of appropriate microhabitat conditions Wetland INC-W-032 is not considered PBTH. Approximately 0.10-acre of DSA was identified. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-033

Wetland INC-W-033 is approximately 0.11-acre PEM resource located in a bermed man-made basin on the north central edge of the Additional Project Area. The wetland is situated on the downstream side of a small bridge structure that crosses an intermittent drainage. The wetland originates from upslope seasonal hillslope groundwater seeps that is conveyed within a small heavily eroded intermittent drainage feature. The surrounding landscape consists of a maintained access drive and a small wooded lot. The wetland vegetation is dominated by cattail and reed canary grass bordered by willow and dogwood. The wetland soil substrate contained areas of soft soils associated with the saturated conditions however, no deep mucky substrate was observed. The wetland contains vegetative species common to bog turtle habitat however, the micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the man-made conditions and the lack of persistent mucky soil conditions, or a persistent spring-fed hydrology, Wetland INC-W-033 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-034

Wetland INC-W-034 is approximately 0.10-acre PEM resource located on the north central edge of the Additional Project Area. The wetland situated in a shallow depression within a wooded/shrubby lot outside of the mowed and maintained cemetery grounds. The wetland extends along the shallow depression that receives seasonal ground water discharge and collects surface water runoff in the depressional topography. The wetland vegetation is dominated by rice cutgrass (*Leersia oryzoides*), fowl mana grass (*Glyceria striata*), and moneywort (*Lysimachia nummularia*). The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-34 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-035

Wetland INC-W-035 is approximately 0.10-acre PEM resource located on the north central edge of the Additional Project Area. The wetland situated in a shallow depression within a wooded/shrubby lot outside of the mowed and maintained cemetery grounds. The wetland extends along the shallow depression that receives seasonal ground water discharge and collects surface water runoff in the shallow depression. The wetland vegetation is dominated by sensitive fern (*Onoclea sensibilis*), fowl mana grass, and moneywort. The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-35 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-036

Wetland INC-W-036 is approximately 0.37-acre palustrine unconsolidated bottom (PUB) resource located on the north central edge of the Additional Project Area. The wetland consists of a man-made impoundment at the edge of the maintained cemetery grounds. The wetland contains surface water that is greater than



twenty inches in depth. The wetland vegetation on the fringe of the impoundment is dominated by cattail. The wetland soil substrate was firm and lacked any mucky substrate. Due the man-made conditions and lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-36 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-037

Wetland INC-W-037 is approximately 0.15-acre PEM resource located in a bermed man-made storm water basin on the southwest corner of the Additional Project Area. The wetland is situated in the man-made depression that contains a small intermittent drainage. The wetland receives additional hydrology from several seasonal hillslope groundwater seeps that originate at the toe -of slope on the edge of the bermed impoundment. The surrounding landscape consists of a small wooded/shrubby lot and periodically mowed impoundment edges. The wetland vegetation is dominated by skunk cabbage, jewel weed, and rice cutgrass and is bordered by willow and dogwood. The wetland soil substrate contained areas of soft soils associated with the saturated conditions however, no deep mucky substrate was observed. The wetland contains vegetative species common to bog turtle habitat however, the micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due to the man-made conditions and the lack of persistent mucky soil conditions, or a persistent spring-fed hydrology, Wetland INC-W-033 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-038

Wetland INC-W-038 is approximately 0.10-acre PSS resource located in the northwest corner of the Additional Project Area. The wetland situated in a shallow depression within a wooded/shrubby lot outside of the maintained cemetery grounds. The wetland extends along the shallow depression that abutting a small heavily eroded intermittent channel. The primary source of wetland hydrology is provided by the seasonal groundwater discharge and storm water runoff that collets in the shallow depression. The wetland vegetation is dominated by lurid sedge (*Carex lurida*), Japanese stilt grass, jewel weed, and spice bush (*Lindera benzoin*). The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and microhabitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-38 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.

Wetland INC-W-039

Wetland INC-W-039 is approximately 0.001-acre PEM resource located in the northwest edge of the Additional Project Area. The wetland situated in a shallow depression on upslope edge of a narrow-wooded strip within the mowed and maintained cemetery grounds. The wetland extends along the shallow depression with compacted soils at the location of a seasonal ground water discharge. The primary source of wetland hydrology is provided by the seasonal groundwater discharge and surface water runoff collection in the compacted soils. The wetland vegetation is dominated by sedges, and Japanese stilt grass. The wetland soil substrate was firm and lacked any mucky substrate. The wetland contains vegetative species common to bog turtle habitat however, the vegetative structure and micro-habitat conditions are not consistent with the conditions commonly observed in bog turtle habitat. Due the lack of a mucky soil conditions, persistent spring-fed hydrology, or a vegetative structure with micro-habitat conditions Wetland INC-W-39 is not considered PBTH. The location of the wetland is depicted on Figure 3. Additional wetland information is provided in Table 1.



Table 1- Wetland Identification Table

Resource ID / DSA¹ ID	Type (PEM/PFO/P SS) ² (EPH, INT, PER) ³	Latitude	Longitude	Approximat e Wetland Acreage w/in Phase 1 Study Area (ac.)	Potential Bog Turtle Habitat or Travel Corridor (Y / N/ UK) ⁴	Approx. Acreage of DSA (ac.)
INC-W-021	PEM	40.419000°	-76.554185°	2.21	N	N/A
INC-W-022	PEM	40.420917°	-76.553552°	0.49	N	N/A
INC-W-023	PEM	40.419725°	-76.562735°	0.03	N	N/A
INC-W-024	PEM	40.420635°	-76.564835°	0.12	N	N/A
INC-W-025	PEM	40.420268°	-76.564792°	0.13	Y	0.01
INC-W-026	PEM	40.419494°	-76.565813°	0.43	Y	0.10
INC-W-027	PEM	40.419953°	-76.567548°	0.10	N	N/A
INC-W-028	PEM	40.420921°	-76.568350°	0.27	Y	0.10
INC-W-029	PEM	40.420197°	-76.568141°	0.25	Y	0.10
INC-W-030	PEM	40.421705°	-76.565821°	0.04	N	N/A
INC-W-031	PEM	40.420949°	-76.565383°	0.10	N	N/A
INC-W-032	PEM	40.421140°	-76.571387°	0.56	N	N/A
INC-W-033	PEM	40.421161°	-76.573448°	0.11	N	N/A
INC-W-034	PEM	40.422194°	-76.574443°	0.10	N	N/A
INC-W-035	PEM	40.423552°	-76.571282°	0.10	N	N/A
INC-W-036	PUB	40.423215°	-76.570849°	0.37	N	N/A
INC-W-037	PEM	40.418551°	-76.576455°	0.15	N	N/A
INC-W-038	PSS	40.421182°	-76.574895°	0.10	N	N/A
INC-W-039	PEM	40.420337°	-76.576480°	0.001	N	N/A

^{1.} PEM-Palustrine emergent, PFO-Palustrine forested PSS-Palustrine scrub-shrub, PUB-Palustrine unconsolidated bottom.

CONCLUSIONS AND COMMENTS

In October 2020 a Phase 1 Bog Turtle Habitat Assessment was completed for the Indiantown Gap National Cemetery Proposed Phase 5 Expansion Project. The results of this survey identified one wetland (INC-W-002) as potential bog turtle habitat. Due to the imminent project schedule a Phase 2 survey was completed for this wetland in the 2021 Phase 2 bog turtle survey season prior to receiving concurrence on the Phase 1 survey results from the USFWS. The results of the Phase 2 survey indicate the probable absence of bog



^{2.} EPH-Ephemeral, INT-Intermittent, PER-Perennial.

^{3.} Y-Yes, N-No, UK-unknown.

turtle in the surveyed wetland. Reports documenting the results of these surveys and are included in a separate submission.

In June 2021 due to recently proposed design refinements an Additional Project Area was added to the Project. As result, on June 10, 2021 a supplemental Phase 1 bog turtle survey was conducted for areas within 300-feet of the proposed LOD for the Additional Project Area. During this survey nineteen wetlands (INC-W-021 through INC-W-39) were investigated. Four wetlands (INC-W-025, INC-W-026, INC-W-028, and INC-W-029) were determined to be PBTH.

Because the Additional Project Area and PBTH was identified after the May requirements of the 2021 Phase 2 bog turtle survey season, conducting Phase 2 surveys for the additional wetlands was not feasible. As such, to try to maintain the proposed project schedule, with the approval of the USFWS, the VA has elected to assume presence of bog turtles in these additional wetlands for the purposes of this Project and employ avoidance measures to ensure no adverse effects to bog turtles. There are no proposed direct impacts to wetlands or watercourses in the Additional Project Area. The proposed disturbance to areas within 300-feet of the identified PBTH will be limited to widening of existing paved walk ways within the mowed and maintained cemetery grounds, installation of informational signage along existing roadways, and non-structural cosmetic maintenance of existing monuments and bridge structures. To avoid adverse effects to bog turtles, all disturbance within 300-feet of the PBTH identified on June 10, 2021, will be conducted during the bog turtle time-of year restriction period between October 01 and March 31, or will be conducted under the supervision of a Recognized Qualified Bog Turtle Surveyor. Due to the currently mowed and maintained conditions adjacent to the PBTH wetlands and the limited disturbance required to complete the work proposed for the Additional Project Area, it is suggested that installation of bog turtle habitat exclusion fencing would result in additional unnecessary disturbance and extend the duration of work time needed to complete the maintenance and upgrades in the areas within 300-feet of the PBTH. As such, it is the recommendation of TES&P's Recognized Qualified Bog Turtle Surveyor that habitat exclusion measures should not be required if the work is conducted under the supervision of a Recognized Qualified Bog Turtle Surveyor, or completed between October 1 and March 31. If additional unanticipated changes to the proposed improvements are encountered the use of habitat exclusion measures will be utilized at the digression of the onsite Recognized Qualified Bog Turtle Surveyor and would be reported to the USFWS immediately.

Thank you for your consideration of these proposed measures. If you have any questions regarding the Project, please feel free to contact me at any time at bthompson@thompsonesp.com or contact Andrew Glucksman of Mabbett at glucksman@mabbett.com.

Sincerely,

Thompson Environmental Surveys & Permitting, LLC.

Bridger Thompson

USFWS/PFBC Qualified Bog Turtle Surveyor

Bilyr J. Thyon

bthompson@thompsonesp.com

(717) 609-3301



Enclosures (4)

Figure 1: Original Project Location Map

Figure 2: Additional Project Area Location Map

Figure 3: Phase 1 Bog Turtle Survey Study Area Maps

Attachment A: PNDI Receipt

Attachment B: USFWS Phase 1 Bog Turtle Habitat Survey Field Forms

Attachment C: Photolog

REFERENCES

- National Geographic Society. 2013. Seamless Layer 2013 (Topo Source: Seamless Digital Raster Graphic-N.P.S. Natural Physical Map & U.S.G.S. Topographic Map i-cubed USGS Quad: Glen Rock, PA).
- U.S. Fish and Wildlife Service (USFWS). 2001. Bog Turtle (Clemmys muhlenbergii), Northern Population Recovery Plan. Hadley, Massachusetts.
- USFWS. 2020 (revised). *Guidelines for Bog Turtle Surveys*. Accessed at www.fws.gov/northeast/nyfo/es/btsurvey.pdf

Figures

Figure 1:

Original Project Location Map

Figure 2:

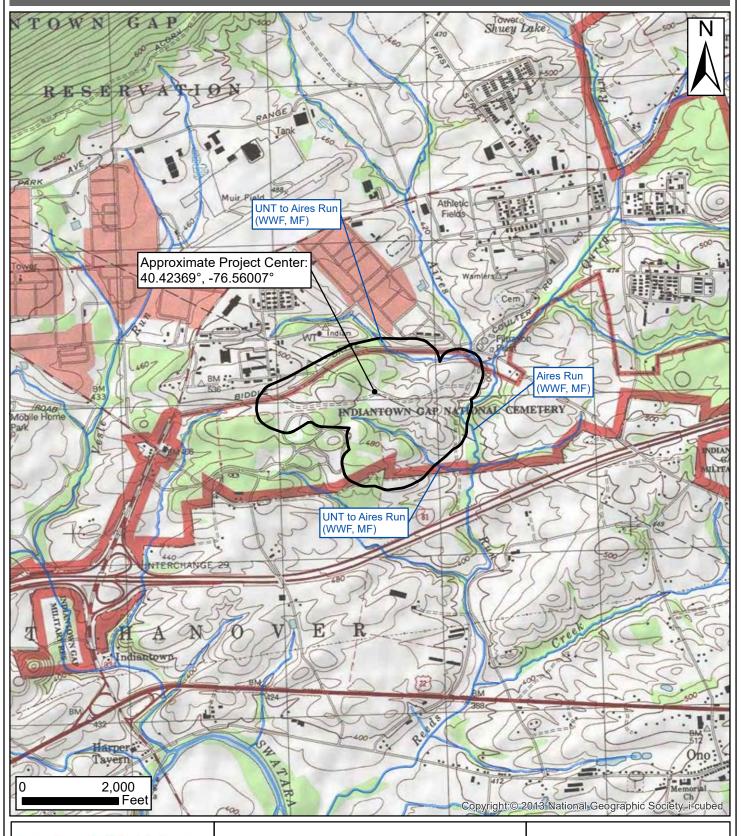
Additional Project Area Project Location Map

Figure 2:

Phase 1 Bog Turtle Habitat Survey Map

INDIANTOWN GAP NATIONAL CEMETERY

Figure 1: Original Project Location Map



THOMPSON ENVIRONMENTAL
Surveys & Permitting, LLC.

Date: 10/18/2020 Created By: CMG

USGS 7.5' Quadrangle: Indiantown Gap
East Hanover and Union Townships
Lebanon County, Pennsylvania

Mabbett*

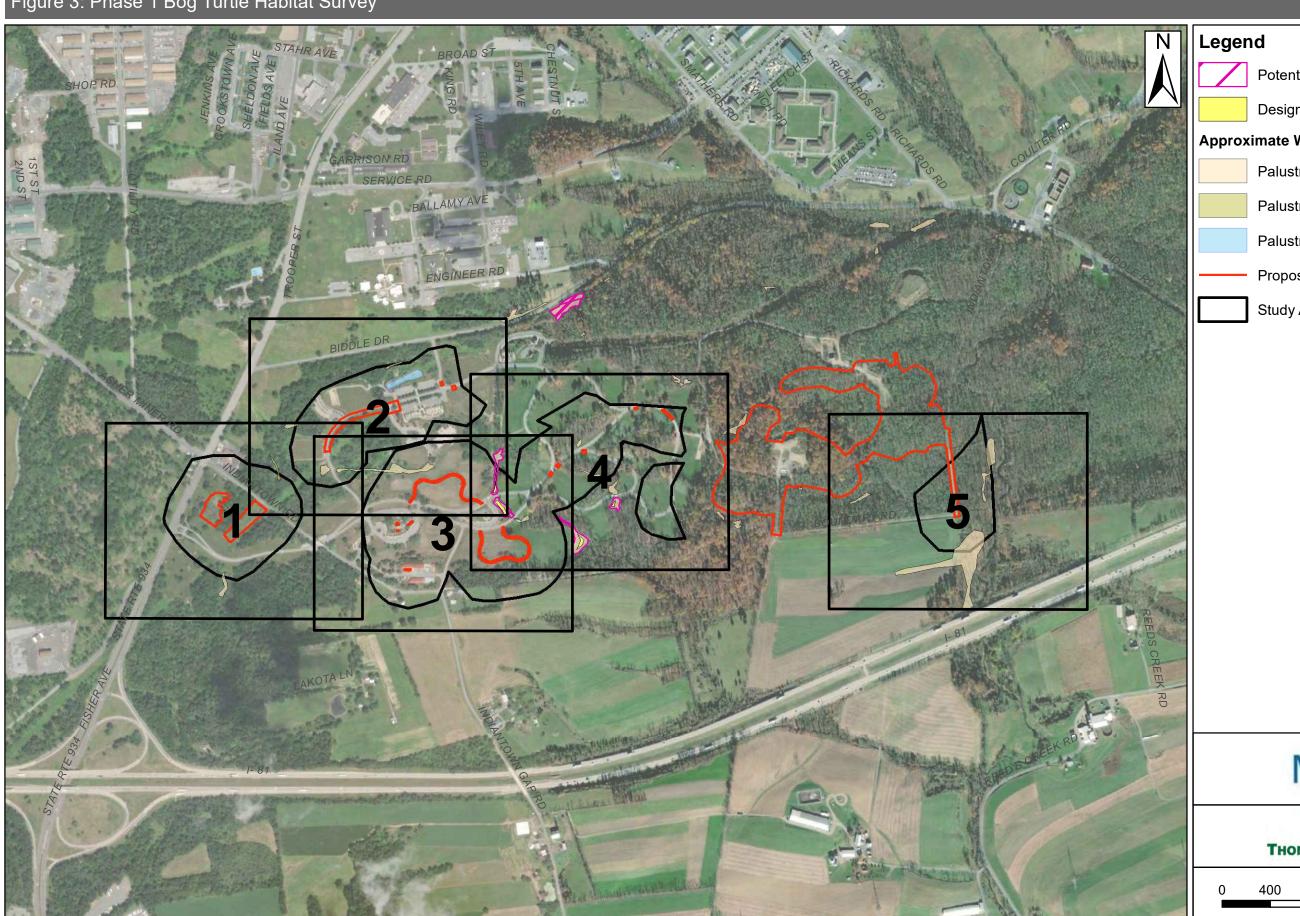
INDIANTOWN GAP NATIONAL CEMETERY Figure 2: Location Map wn Gap RESERVA LLITARY RANGE Tank **UNT to Aires Run** (WWF, MF) Approximate Project Center: 40.42033°, -76.568297° UNT to Aires Run (WWF, MF) Aires Run (WWF, MF) OWN CAP NATIONAL CEMETERY Mobile Hom TATE PARK ial Lake UNT to Indiantown Run (WWF, MF) UNT to Aires Run NTERCHANG (WWF, MF) Indiantown Legend Study Area Proposed LOD 0 2,000 Feet Copyright:© 2013 National Geographic Society, i-cubed



USGS 7.5' Quadrangle: Indiantown Gap
East Hanover Township
Lebanon County, Pennsylvania

Mabbett*

Figure 3: Phase 1 Bog Turtle Habitat Survey



Potential Bog Turtle Habitat

Designated Survey Area

Approximate Wetland Cowardin Classification

Palustrine Emergent (PEM)

Palustrine Scrub-Shrub

Palustrine Unconsolidated Bottom (PUB)

Proposed LOD

Study Area

Mabbett*

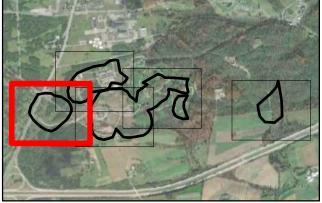


800 ☐Feet

Created By: CMG

Date: 7/21/2021

INC-W-037 (PEM)



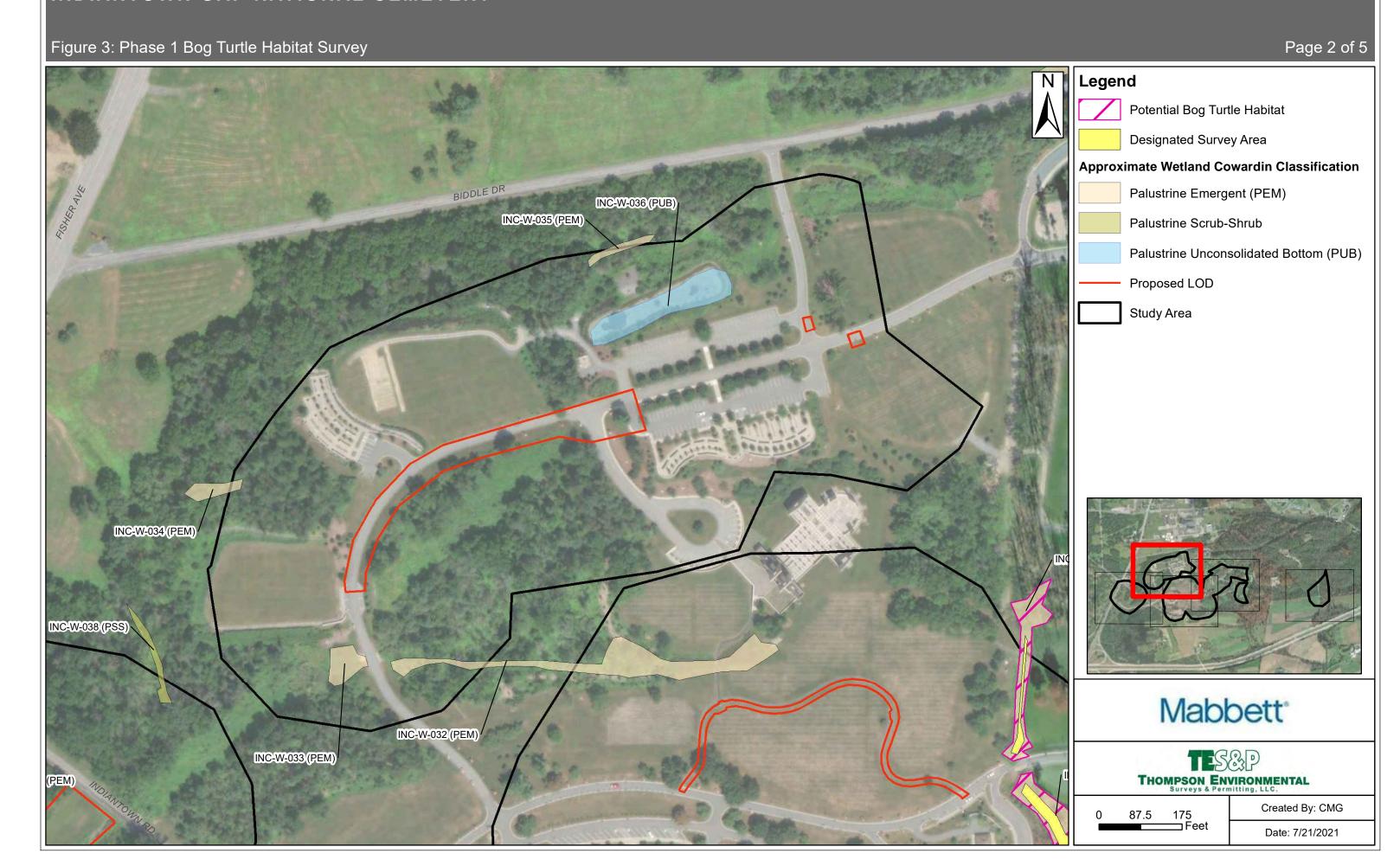
Mabbett*



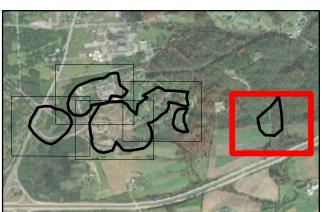
87.5 175 Feet

Created By: CMG

Date: 7/21/2021



INC-W-021 (PEM)



Mabbett*



87.5 175 Feet

Created By: CMG

Date: 7/21/2021

Attachment A

PNDI Receipt



Project Search ID: PNDI-737860

1. PROJECT INFORMATION

Project Name: Final Indiantown Gap National Cemetery Phase 5 Expansion

Date of Review: 7/9/2021 02:59:43 PM

Project Category: Development, Additions/maintenance to existing development facilities

Project Area: 147.28 acres

County(s): Lebanon

Township/Municipality(s): EAST HANOVER TOWNSHIP; UNION TOWNSHIP

ZIP Code:

Quadrangle Name(s): INDIANTOWN GAP

Watersheds HUC 8: Lower Susquehanna-Swatara

Watersheds HUC 12: Bow Creek-Swatara Creek; Reeds Run-Swatara Creek

Decimal Degrees: 40.423303, -76.560872

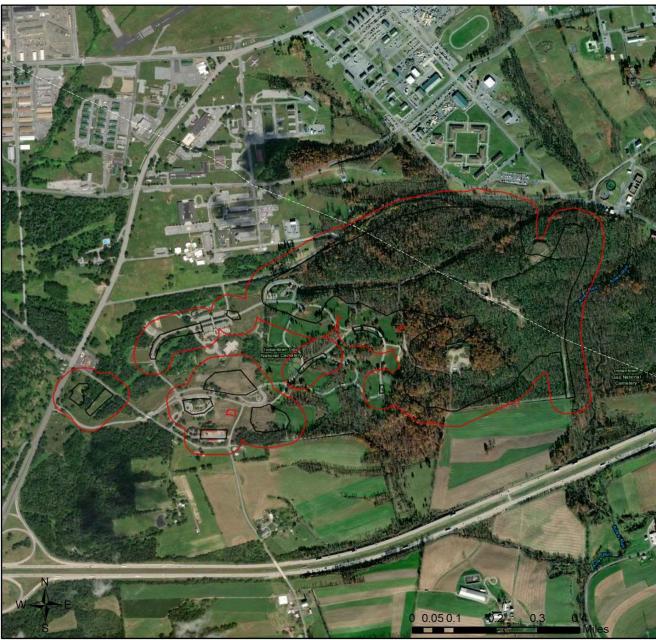
Degrees Minutes Seconds: 40° 25' 23.8910" N, 76° 33' 39.1392" W

2. SEARCH RESULTS

Agency	Results	Response		
PA Game Commission	No Known Impact	No Further Review Required		
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required		
PA Fish and Boat Commission	No Known Impact	No Further Review Required		
U.S. Fish and Wildlife Service	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response		

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Final Indiantown Gap National Cemetery Phase 5 Expansion

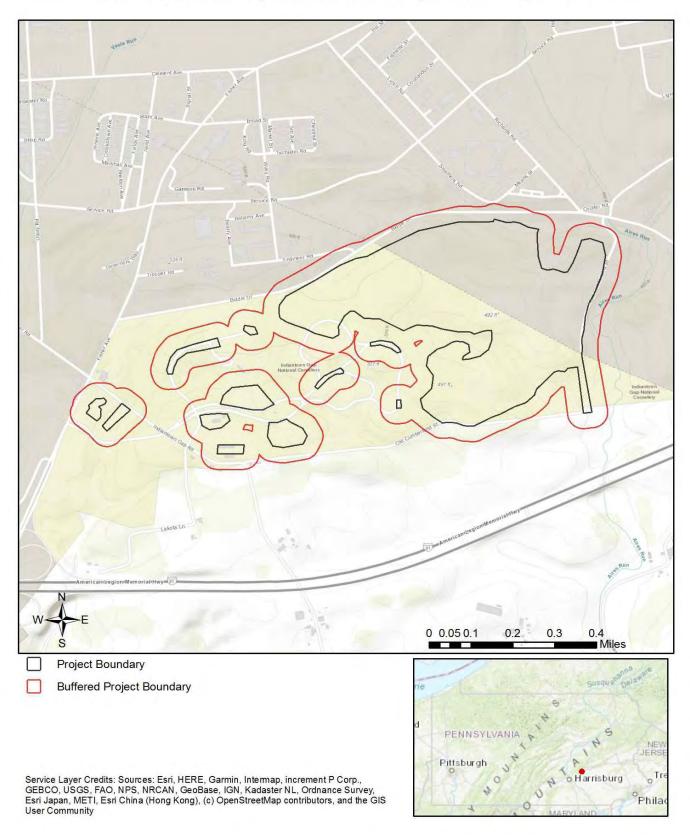


Project Boundary

Buffered Project Boundary

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

Final Indiantown Gap National Cemetery Phase 5 Expansion



RESPONSE TO QUESTION(S) ASKED

Q1: Which of the following closest describes the proposed project?

Your answer is: A well or other groundwater extraction (e.g., groundwater pumping to facilitate mining, pump-and-treat operation) is proposed as part of this project, or in order to support some aspect of the project, and more than 1000 gallons per day will be extracted.

Q2: Are there any perennial or intermittent waterways (rivers, streams, creeks, tributaries) in or near the project area, or on the land parcel?

Your answer is: Yes

Q3: Describe how wastewater (effluent) will be handled (select one). For the purpose of this question, wastewater/effluent does not include stormwater runoff. If the project involves solely the renewal or modification of an existing discharge permit (e.g., NPDES permit), select from options 3, 4, 5, or 6 below.

Your answer is: All wastewater/effluent from this project/activity will be routed to an existing municipal wastewater treatment plant.

Q4: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.

Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

3. AGENCY COMMENTS

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

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

PA Game Commission RESPONSE:

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

PA Department of Conservation and Natural Resources RESPONSE:

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

PA Fish and Boat Commission RESPONSE:

Project Search ID: PNDI-737860

es Project Search ID: PNDI-737860

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

U.S. Fish and Wildlife Service RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).

*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:

____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.

____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)

In addition to the materials listed above, USFWS REQUIRES the following

SIGNED copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.

____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)

____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

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

Project Search ID: PNDI-737860

5. ADDITIONAL INFORMATION

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

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

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section 400 Market Street, PO Box 8552 Harrisburg, PA 17105-8552

Email: RA-HeritageReview@pa.gov

PA Fish and Boat Commission

Division of Environmental Services 595 E. Rolling Ridge Dr., Bellefonte, PA 16823

Name: Mr. Fernando Fernández

Company/Rusiness Name: 110

Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service

Pennsylvania Field Office Endangered Species Section 110 Radnor Rd; Suite 101 State College, PA 16801 Email: <u>IR1_ESPenn@fws.gov</u>

NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management Division of Environmental Planning and Habitat Protection

2001 Elmerton Avenue, Harrisburg, PA 17110-9797

Email: RA-PGC PNDI@pa.gov

NO Faxes Please

7. PROJECT CONTACT INFORMATION

Address: 425 I (eye) Street, NW, Roo	om 6W317D	IIS Allairs, Ollici	<u>e or construction and Facilities Management</u>	ι
City, State, Zip: Washington, D.C. 20	001	V . 00 5 6 7		
Phone:(202) 632-5529	Fax:()		
Email: fernandez@va.gov		31/23/2		
8. CERTIFICATION				
I certify that ALL of the project informa			cluding project location, project and complete. In addition, if the project type	, ڊ
	s, or if the answer	s to any questio	ons that were asked during this online review	
applicant/project proponent signature			date	

ant of Votorona Affaire Office of C

Attachment B

Phase 1 Bog Turtle Habitat Survey Field Forms for the Northern Population Range



Phase 1 Bog Turtle Habitat Survey Data Form for the (Revised April 29, 2020) Please do not edit document.	Wetland ID: INC-W PNDI# (for PA): 737	
Property/Project Name Indiantown Gap National Cen	etery Expansion Project- Additional Project Are	a
Coordinates 40.419000, -76.554/85	Project Type Cemetery Expansion/Upgrades	S
Entity Requesting Phase 1 Survey Mabbett & Associates	s, Inc.	
County/Township/Municipality East Hanover Townshi		
	Affiliation Thompson Environmental	
Other Assistants Present None		
Date of Survey 06/10/2021 Time In 07:00	Time Out 15:00 Air Temp. 75	- ° C°
Last Precipitation < 24 hours × 1-7 days > 1 week _	unknown Drought conditions? Yes X No	
Unknown Drought Index*1 (Circle): none DD D1 D2 D3 I)
location map) Notes (e.g., details about drought, flood, abnormal		
conditions observed):	, -, ,,	
conditions observedy.		
Wetland Size 2.21 acres, if known #Wetlands w/in Pr	oject Area²/9	
Estimate wetland size (acres) < 0.1 0.1 - 0.5 _	0.5 - 1 1 - 2 2 - 4 5+ 10+	
Estimate % Canopy Cover*3 _ 0% \times \leq 5 _ 6-20 _	_ 21-40 41-60 >60	
Hydrology and Soils (check all that apply): use additional page		tion
× Springs/Seeps Springhouse × Trib/Stream Por		
★ Water Visible on Surface Evidence of Flooding ★ Ye		ling ⁵)
Rivulets (inches deep) Subsurface Tunnel/Rivu		6 /
		elv Hr
Yes \times No Are there any signs of disturbance to <u>hydrol</u>		
ponds, roads, beaver activity)?		
Estimate time period (in years) of disturbance*: $_ \le 5$ $\6$ -	1011-20 > 20	
For ditches that may be present, is there bog turtle habitat?	If yes, describe:	
None		
1 (*) Denotes reference to the Supplemental Information docume	nt that provides more details on this particular question.	
² Each wetland must have a separate Phase 1 habitat assessment of		

in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Resulting flooding refers to tidelty influenced wetland (stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: /NC-W-02/	1-021	INC- N	Wetland ID:
-----------------------	-------	--------	-------------

Yes $\frac{X}{X}$ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Ho - Holly Silt loam

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	95%	None	N/A in.	N/A in.
PSS Portion of Wetland:	_5%	None	N/A in.	N/A in.
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	:land:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Salix</i> spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliato	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palvstris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricto	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex Interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
Common Boneset Eupatorium perfoliatum	Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: <u>/\lambda_W</u>
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): Wetland 15 located in wooded Shrubby qully along the flood plain
	of a small perennial westeriourse.
randacabe mile	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
1	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*?YesYesVnkUnkHabitat off-site?YesNoX_Unk
	If yes, how did you conclude this? Phase / survey was conducted to- 2011 will ands w/in 3001 of the project Area.
	withands w/in 3001 of the project Area.
}	Were any bog turtles observed? Yes No If yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles.
	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? Report bog turtle observations to your local FWS field Office and state wildlife office within 48 hrs.
	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? Greet Frog Yes X No Unsure The hydrology criterion for bog turtle habitat is met.
-	Were any bog turtles observed?Yes NoIf yes, how many?
	Were any bog turtles observed? Yes No If yes, how many?
•	Were any bog turtles observed?Yes NoIf yes, how many?
•	Were any bog turtles observed?Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?Yes No If yes, which ones?
	Were any bog turtles observed?Yes No If yes, how many?
•	Were any bog turtles observed?YesNoIf yes, how many?
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local PWS field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Your Yes You Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persistant Spung feel and does not contain mucky soil substrak.
•	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local PWS field Office and state witdlife office within 48 hrs. Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes X No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Is not persistanty spring feel and does not contain mucky soil substrakt. Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
•	Were any bog turtles observed? Yes No If yes, how many? Other herps observed? Yes No If yes, which ones? Yes Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): And Aoes Not contain Mucky Soil Substrake Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridger Thompson Signature Bridger Thompson

	29, 2020) Please do not edit document. PNDI # (for PA): 737860				
	oject Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area				
	41. 42.917, -76. 55.3.5.5.2 Project Type Cemetery Expansion/Upgrades				
Entity Req	esting Phase 1 Survey Mabbett & Associates, Inc.				
	rnship/Municipality East Hanover Township, Lebanon County				
Lead Surve	or Bridger Thompson Environmental				
Other Assi	ants Present None				
	rey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°				
Last Precip	tation < 24 hours X 1-7 days > 1 week unknown Drought conditions? Yes X No				
Unknown I	rought Index*1 (Circle): none DO D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo				
location ma	Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal				
conditions o	served):				
	- 10				
	e <u>0,49</u> acres, if known # Wetlands w/in Project Area ²				
	tland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+				
Estimate %	Estimate % Canopy Cover*3 0% \$ 5 6-20 <u>X</u> 21-40 41-60 > 60				
	nd Soils (check all that apply): use additional pages to further discuss pertinent general wetland information				
	SeepsSpringhouse X_Trib/Stream X_Pond X_StormwaterIron BacteriaWatercress				
\underline{X} Water	isible on Surface Evidence of Flooding \times Yes $_$ No If yes, (\times Seasonal Flooding 4 $_$ Routine Flooding 5)				
Rivulet	(inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)				
X Small I	iddles/Depressions (10 inches deep) \times Saturated soils present? If yes, year-round? \times Likely _ Unlikely _ Un				
	No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, beaver activity)?				
	ne period (in years) of disturbance*: ≤ 56-1011-20 > 20				
Estimate ti	he period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $_ > 20$ hat may be present, is there bog turtle habitat? If yes, describe:				

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

in the wetland and have the highest percent of coverage compared to other species.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID	INC-	W-0	ZZ

Yes \times No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Ho - Holly Silt loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%.	None	N/A in.	N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	in.
POW/PUB Portion of Wet	tland:		in.	in,

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

ou observe that are	e not nated in table n	tile lintes space b	NOVIGED DEIOW OF ITE CH	E CALIE LUDIC CONST	
Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Carnus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	sedges
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	, Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass - Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: //C-W-022
Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): Wetland 1s located in a wooded shrubby Floodway. Situated
Willand is located in a warden since
in a high flow channel at a perential unfacourse.
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or % of the wetland appears to be located off-site
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
None of it All of it Part of it (acres or% of the off-site portion)
Is there potential bog turtle habitat within 300 feet*?Yes X_NoUnk Habitat off-site?YesNo X_Unk
If yes, how did you conclude this? Phase I survey conducted when 300' of Proje
·
AICA
Were any bog turtles observed? Yes No If yes, how many? *Note that you must be permitted by the state ware conducting the survey in to handle bog turtle Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FW Field Office and state wildlife office within 48 hrs
Grentrag.
Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes X No Unsure The soils criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes X No Hosure This wetland HAS potential bog turtle habitat (low to very low quality). Yes X No Hosure The hydrology criterion for bog turtle habitat is met. Unsure The hydrology criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Hosure The hydrology criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Hosure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat is met. Unsure The vegetation criterion for bog turtle habitat
Notes (How did you reach this opinion?): Wetland is treguety fiveded, loss not
contain a mudey soil substrate is not persistently spring to
Notes (How did you reach this opinion?): Wetland is treguety trouded, locs not contain a mudicy soil substruct, is not persistantly spring to locs not contain appropriate iteg structure or micro-habital conditions
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

	evised April 29, 2020) Please do not edit document. PNDI # (for PA): 737860
	roperty/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
Co	pordinates 40.4/9725, -76.562735 Project Type Cemetery Expansion/Upgrades
Er	ntity Requesting Phase 1 Survey Mabbett & Associates, Inc.
	ounty/Township/Municipality East Hanover Township, Lebanon County
Le	ad Surveyor Bridger Thompson Affiliation Thompson Environmental
01	ther Assistants Present None
Da	ate of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°
La	st Precipitation < 24 hours X 1-7 days > 1 week unknown Drought conditions? Yes X No
Uı	nknown Drought Index*1 (Circle): none 00 D1 D2 D3 D4 Wetland Photos Taken × Yes _ No (Provide photo
loc	cation map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
co	anditions observed):
W	etland Size <u>0.03</u> acres, if known # Wetlands w/in Project Area ² <u>19</u>
Es	timate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
Es	timate % Canopy Cover* ³
Hy	ydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
_	_ Springs/Seeps $$ _ Springhouse $$ _ Trib/Stream $$ _ Pond $$ $$ Stormwater $$ $$ Iron Bacteria $$ _ Watercress
_	Water Visible on Surface
_	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
2	\leq Small Puddles/Depressions ($_/$ inches deep) $ imes$ Saturated soils present? If yes, year-round? $ imes$ Likely $_$ Unlikely $_$ U
<u>></u> po	\times Yes _ No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material and shows roads, beaver activity)? We fland is located in a man-made storm water swall
Es	timate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $\times 11-20$ $_ > 20$
	or ditches that may be present, is there bog turtle habitat? If yes, describe:
Fo	

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent

Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
 Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

in the wetland and have the highest percent of coverage compared to other species.

¹

Wetland I	D:	IN	6-1	V-1	02	3

Yes \underline{X} No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

otland inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*: BeB- Brinkerton shaly silt loam

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	N/4 in.
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:			in.	in.
POW/PUB Portion of Wet	land:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. <i>Cornus</i> spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabro	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: _/NC-W-02
E	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	wetland is located in a min made stormwater smale w/19
	a maintained cenetary grounds
ļ	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)?
	X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	f part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	✓ None of itAll of itPart of it (acres or% of the off-site portion)
	is there potential bog turtle habitat within 300 feet* ? $_$ Yes $\ igselow$ No $\ _$ Unk Habitat off-site ? $_$ Yes $\ _$ No $\ igselow$ Unk
	if yes, how did you conclude this? Phase I Survey survey of the project que identified PBTH when 500 feet or this wethered
	identified PBTH when son his me true attend
	300 feet of formal
:	Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turt. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local I field Office and state wildlife office within 48 in
	Other herps observed? Yes XNo If yes, which ones? *Report bog turtle observations to your local I
	The hydrology criterion for bog turtle habitat is met. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present.
	The hydrology criterion for bog turtle habitat is met. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present.
	Other herps observed? Yes No If yes, which ones? Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Which wetland does NOT have potential bog turtle habitat. UNSURE if suitable habitat is present.
	**Recont bog turtle observations to your local Field Office and state wildlife office within 48 - Yes No
	Other herps observed?YesXoIf yes, which ones? "Record togs turtle observations to your local Field Office and state wildlife office within 48 YesXoUnsureThe hydrology criterion for bog turtle habitat is metYesXoUnsureThe soils criterion for bog turtle habitat is metYesXoUnsureThe vegetation criterion for bog turtle habitat is metYesXoUnsureThis wetland HAS potential bog turtle habitat (fair to good quality)YesXoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HAS potential bog turtle habitat (low to very low quality)YesXNoUnsureThis wetland HA
	The hydrology criterion for bog turtle habitat is met. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present. Notes (How did you reach this opinion?): Wetland Surale No Mocile Soil Substitute No Spring Sed Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein i accurate and complete. Print Name Bridger Thompson Signature Signature

Coordinates 40. 42.0 (23.5), -76. Stb 48.35	(Revised April 29, 2020) Please do not edit document.	PNDI# (for PA): 737 866 al Cemetery Expansion Project- Additional Project Area
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc. County/Township/Municipality_East Hanover Township, Lebanon County Lead Surveyor Bridger Thompson Affiliation Thompson Environmental Other Assistants Present None Date of Survey 06/10/2021		
County/Township/Municipality_East Hanover Township, Lebanon County Lead Surveyor_Bridger Thompson	,	
Other Assistants Present None Date of Survey 08/10/2021	County/Township/Municipality East Hanover To	
Other Assistants Present None Date of Survey 08/10/2021	Lead Surveyor Bridger Thompson	
Last Precipitation _ < 24 hours \(\times 1.7 \) days _ > 1 week _ unknown Drought conditions? _ Yes _ No _ Unknown Drought Index*1 (Circle): none (\(\tilde{D} \) D1 D2 D3 D4 Wetland Photos Taken \(\times Yes _ No \) (Provide photo location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed): Wetland Size _ O.1Z _ acres, if known # Wetlands w/in Project Area^2 / 9		Annation
Unknown Drought Index*1 (Circle): none ① D1 D2 D3 D4 Wetland Photos Taken × YesNo (Provide photo location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal conditions observed): Wetland Size ②-/Z acres, if known # Wetlands w/in Project Area²/9 Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 +	Date of Survey 06/10/2021 Time In 07:0	00 Time Out 15:00 Air Temp. 75 F° C°
Wetland Size0./Z acres, if known # Wetlands w/in Project Area²/9 Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0%	Last Precipitation < 24 hours × 1-7 days > 1	week unknown Drought conditions? Yes No
Wetland Size	Unknown Drought Index* 1 (Circle): none 🛈 D1 D	2 D3 D4 Wetland Photos Taken X Yes No (Provide photo
Wetland Size0.7_Zacres, if known # Wetlands w/in Project Area²/9	location map) Notes (e.g., details about drought, flood, a	abnormally dry, and/or snow/ice conditions, and any other seasonal
Wetland Size0.7_Z acres, if known # Wetlands w/in Project Area²/9	conditions observed):	
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0%		
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0%		
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5 + 10 + Estimate % Canopy Cover*3 0%	Wetland Size 0-12 acres, if known # Wetlands	w/in Project Area ² /9
Estimate % Canopy Cover*3 0% <5 6-20 21-40 41-60 >60 Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information 		
Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information X Springs/SeepsSpringhouse X Trib/StreamPond X StormwaterIron BacteriaWatercress X Water Visible on Surface		
∑ Springs/SeepsSpringhouse ∑ Trib/StreamPond ∑ StormwaterIron BacteriaWatercress ∑ Water Visible on Surface		
Water Visible on Surface Evidence of FloodingYesNo _ If yes, (Seasonal Flooding⁴Routine Flooding⁵) X Rivulets (Sinches deep)Subsurface Tunnel/RivuletsTire Ruts (inches deep) X Small Puddles/Depressions (H_inches deep)XSaturated soils present? If yes, year-round? _X_ LikelyUnlikel		
X Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep) X Small Puddles/Depressions (_4 inches deep) X Saturated soils present? If yes, year-round? X Likely Unlikely		
X Small Puddles/Depressions (4 inches deep) X Saturated soils present? If yes, year-round? X LikelyUnlikelyUn X Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Bridge Crossing results in retainable of short was feet. Estimate time period (in years) of disturbance*: < 5 ×6-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:		
X Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Bridge crossing resits in retainable short was fer. Estimate time period (in years) of disturbance*: ≤ 5 X6-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:		
Estimate time period (in years) of disturbance*: _ \le 5 \times 6-10 _ 11-20 _ > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:		
Estimate time period (in years) of disturbance*: ≤ 5 ×6-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:	And the second of the second of the ACC	sing resits in returna of shim water
Estimate time period (in years) of disturbance*: ≤ 5 ×6-1011-20 > 20 For ditches that may be present, is there bog turtle habitat? If yes, describe:		
None		≤ 5 <u>X</u> 6-1011-20> 20
None		
	For ditches that may be present, is there bog turtle	habitat? If yes, describe:
	None	
¹ (*) Denotes reference to the Supplemental Information document that provides more details on this particular question.		
	3 Determine percent cover of abundant species for the we in the wetland and have the highest percent of coverage of the species of the spe	etland, not by wetland type. Abundant species are those that are most prominen

Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
 Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

¹

Wetland I): _	INC	-W7	024

__ Yes \times No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

stland infe

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD - weekert channery silt loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth	
PEM Portion of Wetland:	100%	None	N/A in.	N/A in.	
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>	
PFO Portion of Wetland:	<u></u>		<u>in.</u>	<u>in.</u>	
POW/PUB Portion of Wet	land:		<u>in.</u>	<u>in.</u>	

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Carnus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

C	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): Wetland is located in depressional area on the upstown side of a small bridge wetland extends along an intermittent drawing
	inutland is located in depressional area on the upstravan side of
	a soull bridge wetland extends along an intermittent drawing
	a span bridge
	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)?
	✓ None of it – the entire wetland is within the property boundaries
	Some of it – Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes No Unk
-	If yes, how did you conclude this? Phase I survey identified PBTH w/in 100' of
	this wetland in the downstream side of the bridge
	Structure
,	*Note that you must be permitted by the state you are conducting the survey in to handle oog turtles. Other herps observed? Yes No If yes, which ones? Securify: *Note that you must be permitted by the state you are conducting the survey in to handle oog turtles. *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 nrs.
-	Yes No Unsure The hydrology criterion for bog turtle habitat is met.
	Yes
	Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality).
	Yes \geq No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.
	Notes (How did you reach this opinion?): Wetland lacks mucky suit substrate. evidence of disturbance to hydrology. not persistaty spring ted.
	endnce of disturbance to hydrology.
	and reversety, covers ted.
	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
	Print Name Bridger Thompson Signature Bolger Thompson
	Date 06/10/2021

roperty/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
opercy/11oject Name
pordinates 40. 420 268, 76.564 792 Project Type Cemetery Expansion/Upgrades
ntity Requesting Phase 1 Survey Mabbett & Associates, Inc.
ounty/Township/Municipality East Hanover Township, Lebanon County
ead Surveyor Bridger Thompson Affiliation Thompson Environmental
ther Assistants Present None
ate of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°
ast Precipitation < 24 hours X 1-7 days > 1 week unknown Drought conditions? Yes X No
nknown Drought Index* 1 (Circle): none 🗭 D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo
cation map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
onditions observed):
/etland Size <u>0./3</u> acres, if known #Wetlands w/in Project Area ² /9
stimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
stimate % Canopy Cover*3 0% ∠ ≤5 6-20 21-40 41-60 > 60
ydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
Springs/SeepsSpringhouse X Trib/StreamPondStormwater X Iron BacteriaWatercress
Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
X Rivulets (Z inches deep) X Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
\leq Small Puddles/Depressions ($\frac{1}{2}$ inches deep) \leq Saturated soils present? If yes, year-round? \leq Likely Unlikely Un
Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material ponds, roads, beaver activity)?
stimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $_ 11-20$ $_ > 20$
or ditches that may be present, is there bog turtle habitat? If yes, describe:
None

Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
 Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

in the wetland and have the highest percent of coverage compared to other species.

1

Wetland ID:	INC-	W-025	

Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

etland In

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WCD - weeker channey silt loans

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland	100	Z %.	_ (o in.	<u> </u>
PSS Portion of Wetland:			<u>in.</u>	in.
PFO Portion of Wetland:			<u>in.</u>	in.
POW/PUB Portion of We	tland:		in.	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Common Reed Alnus spp. Phragmites australis		Jewelweed	Rice Cutgrass	Spicebush	Willow spp.	
		Impatiens capensis	Leersia oryzoides	Lindera benzoin	Salix spp.	
Alder-leaved Buckthorn Rhamnus alnifolia Dogwood Spp. Cornus spp.		Mile-A-Minute	Rough-leaved Goldenrod	Spike-Rush	Woolly-fruited Sedge	
		Persicaria perfoliata	Solidago patula	Eleocharis palustris	Carex lasiocarpa	
American Elm Duck Potato Ulmus americana Sagittaria latifolia		Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus	
Arrowhead Eastern Red Cedar		Poison Sumac	Shrubby Cinquefoil	Sweetflag	Yellow-Green Sedge	
Sagittaria latifolia Juniperus virginiana		Toxicodendron vernix	Dasiphora fruticosa	Acorus calamus	Cyperus esculentus	
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	scages	
Cattail	Grass-of-Parnassus	Purple Loosestrife	Smooth Sawgrass	. Tussock Sedge		
Typha spp.	Parnassia glauca	Lythrum salicaria	Cladium mariscoides	Carex stricta		
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.		
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra		

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.): Wetland is located on a gradual hillslope that extends is an intermittend drainage wetland is adjacent to main Cemetery grounds	,
without is located on a gradual hillslope that extends is an intermittent drainage without is adjacent to main cemetery grounds	
an intermittend drawage withand is adjacent to main	∕>
cemetery grounds	staine a
How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site	
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?	
None of it All of it Part of it (acres or% of the off-site portion)	
Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes No	×Unk
If yes, how did you conclude this? This wetland is PBTH	
1113 0001014 3 1 8717	
Were any bog turtles observed? Yes X No If yes, how many? *Note that you must be permitted are conducting the survey in to be of their herps observed? Yes No If yes, which ones? *Report bog turtle observations Field Office and state wild life office.	to your local F
Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.	
Notes (How did you reach this opinion?): Wetland has spring hed hydrology a	nd
muly soil substrate but is limited in size.	
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided accurate and complete.	herein is
accurate and complete.	herein is
accurate and complete.	herein is
Print Name Bridger Thompson Signature Bridger Thompson	herein ì:

Phase 1 Bog Turtle Habitat Survey Data Form for (Revised April 29, 2020) Please do not edit document.	or the Northern Population Range	Wetland ID: <u>/NC-W-02</u> PNDI # (for PA): 737860
Property/Project Name Indiantown Gap Nationa	al Cemetery Expansion Project- Ad	ditional Project Area
Coordinates 40 . 4/9494, -76.5658/3	Project Type Cemetery Ex	xpansion/Upgrades
Entity Requesting Phase 1 Survey Mabbett & Asso		
County/Township/Municipality East Hanover To	ownship, Lebanon County	
Lead Surveyor Bridger Thompson		son Environmental
Other Assistants Present None	Anniadon	
Other Assistants Fresent		
Date of Survey 06/10/2021 Time In 07:00	0Time Out 15:00	Air Temp. 75 F ° C°
Last Precipitation $\underline{}$ < 24 hours $\underline{\times}$ 1-7 days $\underline{}$ > 1	week unknown Drought conditions?	Yes ×_ No
Unknown Drought Index* (Circle): none 00 D1 D2	2 D3 D4 Wetland Photos Taken X Ye	s No (Provide photo
location map) Notes (e.g., details about drought, flood, at		
conditions observed):		•
Wetland Size 0,43 acres, if known #Wetlands		
Estimate wetland size (acres) < 0.1 0.1 - 0	0.5 0.5 -1 1 -2 2 -4	5+ 10+
Estimate % Canopy Cover*3 $_$ 0% \times ≤ 5 $_$ 6	6-20 <u> </u>	
Hydrology and Soils (check all that apply): use addition	nal pages to further discuss pertinent ge	neral wetland information
$\underline{\times}$ Springs/Seeps $\underline{\hspace{0.1cm}}$ Springhouse $\underline{\hspace{0.1cm}}$ Trib/Stream	Pond X Stormwater Iron Bacte	ria Watercress
Water Visible on Surface Evidence of Flooding	g \underline{X} Yes $\underline{\hspace{0.1cm}}$ No $\overline{\hspace{0.1cm}}$ If yes, (\underline{X} Seasonal Floo	ding ⁴ Routine Flooding ⁵)
X Rivulets (Z inches deep) X Subsurface Tunn	nel/Rivulets Tire Ruts (inches de	eep)
× Small Puddles/Depressions (/ inches deep) >	≤ Saturated soils present? If yes, year-rou	ind? <u> </u>
Yes X No Are there any signs of disturbance to		
ponds, roads, beaver activity)?		
Estimate time period (in years) of disturbance*: ≤	56-1011-20 > 20	
For ditches that may be present, is there bog turtle h	nabitat? If yes, describe:	
NONE		

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-026
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__ Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Petland Inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Wed- weeker channey silt loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:	0,10

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%.	_/0	6 in.	10 in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	land:		<u>in.</u>	<u>in,</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed	Jewelweed	Rice Cutgrass	Spicebush	Willow spp.
	Phragmites australis	Impatiens capensis	Leersia oryzoides	Lindera benzoin	Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia Dogwood Spp. Carnus spp.		Mile-A-Minute	Rough-leaved Goldenrod	Spike-Rush	Woolly-fruited Sedge
		Persicaria perfoliata	Solidaga patula	Eleocharis palustris	Carex lasiocarpa
American Elm Ulmus americana	Đuck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush ar Woolgrass Scirpus cyperinus
Arrowhead	Eastern Red Cedar	Poison Sumac	Shrubby Cinquefoil	Sweetflag	Yellow-Green Sedge
Sagittaria latifolia	Juniperus virginiana	Toxicodendron vernix	Dasiphora fruticosa (Acorus calamus	Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail	Grass-of-Parnassus	Purple Loosestrife	Smooth Sawgrass	. Tussock Sedge	
Typha spp.	Parnassia glauca	Lythrum salicaria	Cladium mariscoides	Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Were any bog turtles observed?Yes \(\subseteq \text{No} \) If yes, how many? are conducting the survey in to handle bog to Other herps observed?Yes \(\subseteq \text{No} \) If yes, which ones? **Report bog turtle observations to your local field Office and state wildlife office within 48. \(\subseteq \text{Yes} \) NoUnsure The hydrology criterion for bog turtle habitat is met. \(\subseteq \text{Yes} \) NoUnsure The soils criterion for bog turtle habitat is met. \(\subseteq \text{Yes} \) NoUnsure The vegetation criterion for bog turtle habitat is met. \(\subseteq \text{Yes} \) NoUnsure This wetland HAS potential bog turtle habitat (fair to good quality). \(\subseteq \text{Yes} \) NoUnsure This wetland HAS potential bog turtle habitat (low to very low quality). \(\subseteq \text{This wetland does NOT have potential bog turtle habitat.} \)UNSURE if suitable habitat is present. Notes (How did you reach this opinion?):		Wetland ID: _/NC- W-0ZC
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it — the entire wetland is within the property boundaries Some of it — Acres or % of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it All of it Part of it (acres or % of the off-site portion) Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes No Unk Habitat off-site? Yes No Unif yes, how did you conclude this? This wetland is PBTH Were any bog turtles observed? Yes No If yes, how many? **Room tog purtle observed in the habitat is met. X Yes No Unsure The hydrology criterion for bog turtle habitat is met. X Yes No Unsure The vegetation criterion for bog turtle habitat is met. X Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good qua		Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it — the entire wetland is within the property boundaries Some of it — Acres or % of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it All of it Part of it (acres or % of the off-site portion) Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes No Unk Habitat off-site? Yes No Unif yes, how did you conclude this? This wetland is PBTH Were any bog turtles observed? Yes No If yes, how many? **Room tog purtle observed in the habitat is met. X Yes No Unsure The hydrology criterion for bog turtle habitat is met. X Yes No Unsure The vegetation criterion for bog turtle habitat is met. X Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good qua		withand is located in large dipressional area abotting a
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If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?		
		Some of it = Acres or% of the wetland appears to be located on-site
If yes, how did you conclude this? This within 300 feet*? X yes _ No _ Unk Habitat off-site? _ yes _ No _ Unit lif yes, how did you conclude this? This within dis _ PBTH Were any bog turtles observed? _ Yes _ No _ If yes, how many? ***More that you must be permitted by the first of the part of th		If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
Were any bog turtles observed?YesX NoIf yes, how many?		None of it All of it Part of it (acres or% of the off-site portion)
Were any bog turtles observed?Yes \(\sum \) No If yes, how many? are conducting the survey in to handle bog turned observed?Yes \(\sum \) No If yes, which ones? **Report bog turtle observations to your local field Office and state wild life office within 48. \(\sum \) Yes No Unsure The hydrology criterion for bog turtle habitat is met. \(\sum \) Yes No Unsure The soils criterion for bog turtle habitat is met. \(\sum \) Yes No Unsure The vegetation criterion for bog turtle habitat (fair to good quality). \(\sum \) Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). \(\sum \) Yes No Unsure This wetland HAS potential bog turtle habitat (fow to very low quality). \(\sum \) This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present. \(\text{Notes} \) (How did you reach this opinion?):		Is there potential bog turtle habitat within 300 feet*? 🔀 Yes 🔝 No 🔠 Unk Habitat off-site? Yes 🔝 No 💆 Unk
Were any bog turtles observed?Yes \(\sum \) No If yes, how many? are conducting the survey in to handle bog turned observed?Yes \(\sum \) No If yes, which ones? **Report bog turtle observations to your local field Office and state wild life office within 48. \(\sum \) Yes No Unsure The hydrology criterion for bog turtle habitat is met. \(\sum \) Yes No Unsure The soils criterion for bog turtle habitat is met. \(\sum \) Yes No Unsure The vegetation criterion for bog turtle habitat (fair to good quality). \(\sum \) Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). \(\sum \) Yes No Unsure This wetland HAS potential bog turtle habitat (fow to very low quality). \(\sum \) This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present. \(\text{Notes} \) (How did you reach this opinion?):		If yes, how did you conclude this? This wetten die PBTH
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YesNoUnsure This wetland HAS potential bog turtle habitat (low to very low quality)This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present. Notes (How did you reach this opinion?):		∠ Yes No Unsure The vegetation criterion for bog turtle habitat is met.
This wetland does NOT have potential bog turtle habitat.		
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridger Thompson Signature 3 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -		
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridger Thompson Signature 3 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -		Notes (How did you reach this oninion?):
Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete. Print Name Bridger Thompson Signature 3 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -		Motes (now did you read it will be prosing a problem of the second of th
Print Name Bridger Thompson Signature Bridger Thompson Date 06/10/2021		and contains areas it mucky soil substrate
Print Name Bridger Thompson Signature 3 April 1 April 1 April 1 April 1 April 2 April		Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is
Date 06/10/2021		accurate and complete.
		Print Name Bridger Thompson Signature By Thyper
Contact Information bthompson@thompsonesp.com, 717-609-3301		Data 06/10/2021
Contact management		Date

Phase 1 Bog Turtle Habitat Survey Data Form for the N (Revised April 29, 2020) Please do not edit document.	PNDI# (for PA): 737860
Property/Project Name Indiantown Gap National Ceme	etery Expansion Project- Additional Project Area
Coordinates 40.4/9953, -76.567548 Entity Requesting Phase 1 Survey Mabbett & Associates, County/Township/Municipality East Hanover Township	Inc.
	Affiliation Thompson Environmental
Date of Survey 06/10/2021 Time In 07:00 Last Precipitation < 24 hours × 1-7 days > 1 week Unknown Drought Index*1 (Circle): none 00 D1 D2 D3 Delocation map) Notes (e.g., details about drought, flood, abnormally conditions observed):	unknown Drought conditions?YesNo 4 Wetland Photos Taken \(\times\) YesNo (Provide photo
	0.5 - 1 1 - 2 2 - 4 5+ 10+ 21-40 41-60 > 60 s to further discuss pertinent general wetland information d Stormwater Iron Bacteria Watercress No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
Estimate time period (in years) of disturbance*: ≤ 56-1 For ditches that may be present, is there bog turtle habitat?	
None	
in the wetland and have the highest percent of coverage compared	ita form completed. : by wetland type. Abundant species are those that are most prominer

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

1

Wetland ID:	INC-W	-0	2	7

⊻YesNo	Are there	any signs	of disturb	ance to <u>vegetation</u> (e.	g., mowing, pasturing, burning)?	If yes, describe:
Po.	rtions	have	been	periodically	moved.	

intland in

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WED - WEIKER Channey silt loam

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%	None	N/A in.	~/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wet	tland:		in	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder 5pp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush <i>Lindera benzoin</i>	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricto	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Pholoris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: _/NC-W-02フ
Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
wethand ax tods from a moved maintained laws to a heavily evode. Internitated drainage
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? \(\sum \) None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
None of it All of it Part of it (acres or% of the off-site portion)
Is there potential bog turtle habitat within 300 feet*? $\underline{\times}$ Yes No Unk Habitat off-site? Yes No $\underline{\times}$ Unk
If yes, how did you conclude this? Phase I survey identified adjacant metlands
AS PBTH
Were any bog turtles observed?YesNoIf yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed?YesNoIf yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes X No Unsure The soils criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes X No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present.
Notes (How did you reach this opinion?): wettand is not soving ted and does
Notes (How did you reach this opinion?): Wetland is not spring ted and does
not contain mucky boil substrate; Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
Lead Surveyor — please sign below certifying to the best of your knowledge that all of the information provided herein is

Indiantous Can Nati	and Compton Evangion Project Additional Project Area
	onal Cemetery Expansion Project- Additional Project Area
Coordinates 40.420921, -76.56835	Project Type Cemetery Expansion/Upgrades
Entity Requesting Phase 1 Survey Mabbett & A	ssociates, Inc.
County/Township/Municipality East Hanover	
Lead Surveyor Bridger Thompson	Affiliation Thompson Environmental
Other Assistants Present None	
Date of Survey 06/10/2021 Time In 0	7:00 Time Out 15:00 Air Temp. 75 F ° C°
Last Precipitation < 24 hours X 1-7 days	> 1 week unknown Drought conditions? Yes × No
	D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo
	d, abnormally dry, and/or snow/ice conditions, and any other seasonal
conditions observed):	
Estimate % Canopy Cover*3 _ 0% \times \leq 5 _	6-20 21-40 41-60 > 60
 ✓ Springs/Seeps Springhouse	e to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
 ✓ Springs/Seeps Springhouse	ramPondStormwater ×_Iron BacteriaWatercress IndingYes × No If yes, (Seasonal FloodingRoutine FloodingStunnel/RivuletsTire Ruts (inches deep) Indicate to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material, as crossed by small bridge Sheets
∑ Springs/Seeps Springhouse	amPondStormwater ×_Iron BacteriaWatercress IdingYes × No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵) Funnel/RivuletsTire Ruts (inches deep) p) × Saturated soils present? If yes, year-round? × LikelyUnlikelyUn the to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material, so crossed by small bridge Sheeche

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID	: INC	W-028	

Yes \underline{X} No Are there any signs of disturbance to $\underline{vegetation}$ (e.g., mowing, pasturing, burning)? If yes, describe:

etland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BrB-Brinkelton silt loam

	0,10	
How much suitable habitat is in this wetland? Estimate acreage or percentage: _		

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%.	107.	6 in.	/2 in.
PSS Portion of Wetland:		_,	in.	<u>in.</u>
PFO Portion of Wetland:			in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. <i>Sali</i> x spp.
Alder-leaved Buckthorn Rhamnus alnifolio	Dogwood Spp. Carnus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. <i>Polygonum</i> spp.	*0
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium Virnineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

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ır part					of the off-site						
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if yes,	how did yo	u conclude	this? –	This	wettand	(and	adjac	int a	ctia	inds a	y wy
	7	PBTH.									
			ved?Yes 'es ∠No		If yes, how th ones?	many?	_	*Report bog t	ng the surve turtle absen	permitted by the y in to handle be vations to your le dife office within	og tur ocal f
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	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: //NC-W-02.9 PNDI # (for PA): 73.7840
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
	Coordinates 40.420/97, -16.568/4/ Project Type Cemetery Expansion/Upgrades
General Info	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
eral	County/Township/Municipality East Hanover Township, Lebanon County
Ger	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
	Other Assistants Present None
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°
5	Last Precipitation < 24 hours × 1-7 days > 1 week unknown Drought conditions? Yes × No
Date/Condition	Unknown Drought Index*1 (Circle): none 00 D1 D2 D3 D4 Wetland Photos Taken XYesNo (Provide photo
<u>5</u>	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
Date	conditions observed):
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+ Estimate % Canopy Cover*3 0%
Wetland Info	X Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Wethand is crussed by small bodge
	Estimate time period (in years) of disturbance*: < 56-10 <u>X</u> 11-20 > 20
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None
	¹ (*) Denotes reference to the Supplemental Information document that provides more details on this particular question.

² Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland	ID:	14	K-1	W	-0	2	9

Yes \underline{X} No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BrB- Brinkerton silt loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	100%.	10%	4 in.	/2 in.
PSS Portion of Wetland:		<u></u>	<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:		<u> </u>	<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wet	land:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush <i>Lindera benzoin</i>	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabro	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

								10 10 11			ID: <u>/NC-W-02</u>
								cultural field,			trat
Wes	lana	13	1020	-	.1/	inter	rs Hur!	dvaine	9G.L	w.tla	nd is
CXH	uas	TO	, 4	5M	4//	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	11/201	,		1.	,
i prop	all A	L.	7	9	MUV	ممد جر	man.	thinid	et.	noray	grumds
v much	× No	ne of it	- the e	ntire we	etland is	within th	e propert	y boundarie	es		
art of th	his wetla	nd con	tinues	off-site,	how mu	ch of the	off-site p	ortion was	surveyed	d (on foot)?	
	No	ne of it	AI	of it	_ Part o	f it (acres or	% of th	e off-site	e portion)	
nere po	tential b	og turt	le habi								
es, how	did you	conclu	de this	? -	This	wet	and	and	adj	quist u	retlands a
	PRT	Z/.									
•	,	•									
Yes _ Yes _ Yes _ Yes _	No No No No	Unsu Unsu Unsu Unsu	ire Th ire Th ire Th ire Th	e soils c e veget is wetla is wetla	riterion ation cri nd HAS nd HAS	for bog to terion for potential potential	irtle habi bog turtl bog turtle bog turtle	at is met. e habitat is habitat (fa habitat (lo	met. ir to goo w to ver	y low quality)	
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	veyor – I and com		si gn bel	ow cert	ifying to	the best	of your ki	nowledge th	at all of	the informati	on provided hereir
curate a		plete.								the informati	
curate a	and com	plete.									
A 7 6	v much vere porces, however herp Yes Yes Yes Yes This we	w much of this well a wites (How did you have a no yes _	w much of this wetland None of it Some of it There potential bog turt Tes, how did you concludes, how did you concludes, how did you concludes any bog turtles observed? YesNoUnsuryesNoUnsur	w much of this wetland is loca None of it — the e Some of it — art of this wetland continues of More of it — All here potential bog turtle habit es, how did you conclude this PBTH re any bog turtles observed? er herps observed? — Yes Yes — No — Unsure Th	w much of this wetland is located off- X None of it — the entire we Some of it — Acres art of this wetland continues off-site, None of itAll of it here potential bog turtle habitat with es, how did you conclude this? PBTH The any bog turtles observed?Yes er herps observed?Yes YesNoUnsure The hydro YesNoUnsure The vegeta YesNoUnsure This wetlan YesNoUnsure This wetlan	w much of this wetland is located off-site (i.e., None of it – the entire wetland is Some of it – Acres or art of this wetland continues off-site, how mu None of it _ All of it _ Part of the potential bog turtle habitat within 300 fees, how did you conclude this? PBTH. The any bog turtles observed? _ Yes _ No er herps observed? _ Yes _ No if yes, where the potential bog turtle habitat within 300 fees, how did you conclude this? Yes _ No _ Unsure The hydrology crit Yes _ No _ Unsure The soils criterion Yes _ No _ Unsure The vegetation crityes _ No _ Unsure This wetland HAS; This wetland does NOT have potential bog turtles (How did you reach this opinion?):	wmuch of this wetland is located off-site (i.e., outside to some of it — the entire wetland is within the	w much of this wetland is located off-site (i.e., outside the proper None of it – the entire wetland is within the propert Some of it – Acres or% of the wetland art of this wetland continues off-site, how much of the off-site p None of it All of it Part of it (acres or here potential bog turtle habitat within 300 feet*? X Yes No ere potential bog turtle habitat within 300 feet*? Yes No ere herps observed? Yes No if yes, which ones? Yes No Unsure The hydrology criterion for bog turtle yes No Unsure The soils criterion for bog turtle habit yes No Unsure The vegetation criterion for bog turtle yes No Unsure This wetland HAS potential bog turtle yes No Unsure This wetland HAS potential bog turtle yes No Unsure This wetland HAS potential bog turtle yes No Unsure This wetland HAS potential bog turtle this wetland does NOT have potential bog turtle habitat. Inter (How did you reach this opinion?):	w much of this wetland is located off-site (i.e., outside the property boundaries—Some of it — the entire wetland is within the property boundaries—Some of it — Acres or — % of the wetland appears to be art of this wetland continues off-site, how much of the off-site portion was — None of it — All of it — Part of it (acres or % of the property boundaries, how did you conclude this? This wetland and part of the off-site portion was acres or % of the property boundaries, how did you conclude this? This wetland and part of it (acres or % of the property boundaries, how did you conclude this? This wetland and part of it (acres or % of the property boundaries, how did you conclude this? This wetland for yes, how many? we have a property boundaries of the property boundaries of the property boundaries. This wetland has potential bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The wetland HAS potential bog turtle habitat (for this wetland does NOT have potential bog turtle habitat UNSUR	w much of this wetland is located off-site (i.e., outside the property boundaries or right which is wetland is located off-site (i.e., outside the property boundaries or right with the property boundaries within the property boundaries or of the wetland appears to be located art of this wetland continues off-site, how much of the off-site portion was surveyed with a surveyed with	Some of itAcres or% of the wetland appears to be located off-site art of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)? None of it All of it Part of it (acres or% of the off-site portion) here potential bog turtle habitat within 300 feet*? \(\times \) Yes No Unk Habitat off-site? es, how did you conclude this? This wetland and adjacn \(\times \) PBTH. The any bog turtles observed? Yes No If yes, how many? are conduct er herps observed? Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is wetles (How did you reach this opinion?):

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C-W-03 PNDI# (for PA): 737860						
	Property/Project Name Indiantown Gap National Cemetery Expansion Project-Additional Project Area						
General Into	Coordinates 40. 421 705, 76. 56 5821 Project Type Cemetery Expansion/Upgrades						
	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.						
8	County/Township/Municipality East Hanover Township, Lebanon County						
	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental						
	Other Assistants Present None						
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°						
5	Last Precipitation < 24 hours 1-7 days > 1 week unknown Drought conditions? Yes No						
Date/ Collaining	Unknown Drought Index*1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken Yes No (Provide photo						
5	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal						
5	conditions observed):						
•							
	Wetland Size						
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+						
	Estimate % Canopy Cover*3 0% × 55 6-20 21-40 41-60 > 60						
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information						
	Springs/Seeps Springhouse Trib/Stream PondX Stormwater Iron Bacteria Watercress						
	Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)						
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)						
	Small Puddles/Depressions (inches deep)Saturated soils present? If yes, year-round?Likely Unlikely Unk						
Wedding mile	Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)? Within a 15 associated of perched storm water Missing the compacted soils						
	Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $\times 11-20$ $_ > 20$						
	For ditches that may be present, is there bog turtle habitat? If yes, describe:						
	None						

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC.	W-030

Yes _ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Portion's periodically mowed

of backto

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4 Mowing occurs during bog turtle active season

Soil types present*:

WED - We Kert channey selt loans

How much suitable habitat is in this wetland? Estimate acreage or percentage:	None
HOW HIGH Saltable Highligh is in this Acciding. Estimate acreage at benceitage.	

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck Non L	Avg. Muck Depth Main.	Max. Muck Depth N/A in.
PSS Portion of Wetland:			<u>in.</u>	in.
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of We	tland:		<u>in.</u>	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Sallx spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiona	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. <i>Polygonum</i> spp.	(bulish)
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricto	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: INC-W-030
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	without is located in shallow compessed dipression
	without is located in shallow compessed dipression on the edge of a moved maintened conclary grown
ralluscape illio	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? You note the entire wetland is within the property boundaries Some of it — Acres or% of the wetland appears to be located off-site
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? 🗹 Yes 🔝 No 💢 Unk Habitat off-site? Yes 🔝 No 🔀 Unk
	If yes, how did you conclude this? Phase I curry identified PBTH IN adjacent
	Were any bog turtles observed? Yes No if yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed? Yes No if yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
	Were any bog turtles observed? Yes No if yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No if yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met.
. ,	Were any bog turtles observed?Yes ×_Noif yes, how many?
,	Were any bog turtles observed?Yes \(\subseteq \) No if yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?Yes \(\subseteq \) No if yes, which ones? *Regort bog turtle observations to your local FWS Field Office and state wild life office within 48 hrs. Yes \(\subseteq \) No Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The soils criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.
	Were any bog turtles observed?Yes \(\subseteq \) No if yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?Yes \(\subseteq \) No if yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes \(\subseteq \) No Unsure The hydrology criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The soils criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure The vegetation criterion for bog turtle habitat is met. Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes \(\subseteq \) No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present. Notes (How did you reach this opinion?):

Date 06/10/2021

Contact Information bthompson@thompsonesp.com, 717-609-3301

Property/Project Name Indiantown Gap Nationa	l Cemetery Expansion Project- Additional Project Area					
Coordinates 40. 420949, -76.565383	Project Type Cemetery Expansion/Upgrades					
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.						
County/Township/Municipality East Hanover Township, Lebanon County						
	Affiliation Thompson Environmental					
Other Assistants Present None						
Date of Survey 06/10/2021 Time In 07:00	Time Out 15:00 Air Temp. 75 F° C°					
Last Precipitation < 24 hours × 1-7 days > 1 v	veek unknown Drought conditions? Yes × No					
Unknown Drought Index*1 (Circle): none DD D1 D2	D3 D4 Wetland Photos Taken X Yes No (Provide photo					
location map) Notes (e.g., details about drought, flood, ab	normally dry, and/or snow/ice conditions, and any other seasonal					
conditions observed):						
Wetland Size 0./0 acres, if known # Wetlands v	w/in Project Area ² /9					
	.5 0.5 -1 1 -2 2 -4 5+ 10+					
Estimate % Canopy Cover*3 _ 0% _ ≤5 × 6						
	al pages to further discuss pertinent general wetland information					
	Pond X Stormwater Iron Bacteria Watercress					
	∠ Yes _ No If yes, (∠ Seasonal Flooding⁴ _ Routine Flooding⁵)					
Rivulets (inches deep) Subsurface Tunn						
	∠Saturated soils present? If yes, year-round?Likely ∠ Unlikely Un √Saturated soils present? If yes, year-round?Likely ∠ Unlikely Un √Saturated soils present? If yes, year-round?Likely ∠ Unlikely Un √Saturated soils present? If yes, year-round?Likely ∠ Unlikely Un √Saturated soils present? Unlikely Un √Saturated soils present √Satura					
	hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material,					
	associated of collected storm water					
	45500) quel VI Collecto State					
discharge						
Estimate time period (in years) of disturbance*:≤	5 <u>×</u> 6-10 <u>11-20</u> > 20					
For ditches that may be present, is there bog turtle ha	abitat? If yes, describe:					
None						

Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
 Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

¹

Wetland ID:	INC-W	1-031
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Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*: WeD - weiker channey sift loan

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PSS Portion of Wetland:			in.	in.
PFO Portion of Wetland:			in.	in.
POW/PUB Portion of Wes	tland:		in.	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa polustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> Spp.	
Common Boneset Eupatorium perfoliatum	lapanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID: /NC-W-03/
	Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	wetland is located in dipressional topo wing wooded
	strip that collects stormwate runoff
	STIP THAT CONCERS STOPMENT FORDER
_	
nfo L	Dans march of this weekland in larger of office of the first survey of the constant of the first state of th
ape	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? None of it – the entire wetland is within the property boundaries
Landscape Info	Some of it Acres or% of the wetland appears to be located off-site
ية	If your of all in combination on off size by the first of the combination constraints of the combination of
	If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of itAll of itPart of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*? X Yes No Unk Habitat off-site? Yes No Unk
	If yes, how did you conclude this? Phase I survey identified adjacant methods
	45 PBTH.
	45 7677
	*Note that you must be permitted by the state you
Species	Were any bog turtles observed?YesNoIf yes, how many? are conducting the survey in to handle bog turtles.
Spe	Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
	Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met.
	Yes \(\sum \) No \(\sum \) Unsure The vegetation criterion for bog turtle habitat is met.
	Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality).
	YesNo Unsure This wetland HAS potential bog turtle habitat (low to very low quality). YesNo Unsure This wetland HAS potential bog turtle habitat UNSURE if suitable habitat is present.
Ę	
Cpinion	Notes (How did you reach this opinion?): Wetland is not spring hed. wetland does not contain mucky substrate
	withand does not contain micky
Vey	Substrate
ead Surveyor	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.
_	
	Print Name Bridger Thompson Signature Bollow
	Date 06/10/2021
	Contact Information bthompson@thompsonesp.com, 717-609-3301

(Revised April 29, 2020) Please do not edit document. PNDI#(for PA): 737860					
Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area					
Coordinates 40.421140, 76.571387 Project Type Cemetery Expansion/Upgrades					
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.					
County/Township/Municipality East Hanover Township, Lebanon County					
Lead Surveyor Bridger Thompson Affiliation Thompson Environmental					
Other Assistants Present None					
Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°					
Last Precipitation < 24 hours × 1-7 days > 1 week unknown Drought conditions? Yes × No					
Unknown Drought Index*1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo					
location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal					
conditions observed):					
Wetland Size 0:56 acres, if known #Wetlands w/in Project Area ² 19					
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+					
Estimate % Canopy Cover*3 0%					
Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information					
X Springs/Seeps Springhouse X_Trib/Stream Pond X_Stormwater X_Iron Bacteria Watercress					
✓ Water Visible on Surface Evidence of Flooding ✓ Yes No If yes, Seasonal Flooding ⁴ Routine Flooding ⁵)					
Rivulets (inches deep) × Súbsurface Tunnel/Rivulets Tire Ruts (inches deep)					
Small Puddles/Depressions (inches deep) × Saturated soils present? If yes, year-round? Likely × Unlikely Unl					
Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,					
ponds, roads, beaver activity)?					
Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20					
En 1901 of the Control of the Contro					
For ditches that may be present, is there bog turtle habitat? If yes, describe:					

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

in the wetland and have the highest percent of coverage compared to other species.

¹

Yes XNo Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

etland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

How much suitable habitat is in this wetland? Estimate acreage or percentage: ____

None

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth Main.	Max. Muck Depth
PSS Portion of Wetland:			<u>in.</u>	in.
PFO Portion of Wetland:			in.	in,
POW/PUB Portion of Wes	tland:	***	in.	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus omericano	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Larix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

D	Wetland ID: $NC-W-O3$ rescribe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	without extends from a narrow swale into a wooded gully
	surrounded by moved maintained centrary grands
	How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
	None of it All of it Part of it (acres or% of the off-site portion)
	s there potential bog turtle habitat within 300 feet*? _ Yes $ imes$ No _ Unk Habitat off-site? _ Yes _ No $ imes$ Un fyes, how did you conclude this?
	fyes, how did you conclude this? Phase I surely was conducted when 30
	Were any bog turtles observed?Yes ∠ No!f yes, how many? **Note that you must be permitted by the state are conducting the survey in to handle bog turbler herps observed? ∠ Yes No!f yes, which ones? **Report bog turtle observations to your local field Office and state wildlife office within 48
	Nere any bog turtles observed? Yes X No If yes, how many? are conducting the survey in to handle bog turtler herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local field office and state wildlife office within 48 Yes X No Unsure The hydrology criterion for bog turtle habitat is met. Yes X No Unsure The soils criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure The vegetation criterion for bog turtle habitat is met. Yes X No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes X No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
	Nere any bog turtles observed? _Yes _No _ If yes, how many? are conducting the survey in to handle bog turble herps observed? ∠Yes _ No _ If yes, which ones? —Yes ∠No _ Unsure _ The hydrology criterion for bog turtle habitat is met. —Yes ∠No _ Unsure _ The soils criterion for bog turtle habitat is met. —Yes _ No _ Unsure _ The vegetation criterion for bog turtle habitat is met. —Yes ∠No _ Unsure _ This wetland HAS potential bog turtle habitat (fair to good quality). —Yes ∠No _ Unsure _ This wetland HAS potential bog turtle habitat (low to very low quality). —This wetland does NOT have potential bog turtle habitat UNSURE if suitable habitat is present.

Contact Information bthompson@thompsonesp.com, 717-609-3301

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: //NC-W-033 PNDI # (for PA): 737866				
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area				
	Coordinates 40.421141 - 76.573448 Project Type Cemetery Expansion/Upgrades				
2	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.				
5	County/Township/Municipality East Hanover Township, Lebanon County				
dellerar IIIIo					
)					
	Other Assistants Present None				
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°				
=	Last Precipitation < 24 hours X 1-7 days > 1 week unknown Drought conditions? Yes X No				
3	Unknown Drought Index *1 (Circle): none DD D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo				
3	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal				
Date/condition	conditions observed):				
•					
	Wetland Size O/// acres, if known # Wetlands w/in Project Area² Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+				
	Estimate % Canopy Cover*3 × 0% ≤ 5 6-20 21-40 41-60 > 60				
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information				
	Springs/Seeps Springhouse Trib/Stream Pond $ imes$ Stormwater Iron Bacteria Watercress				
	∠ Water Visible on Surface Evidence of Flooding ∠ Yes _ No If yes, (Seasonal Flooding ∠ Routine Flooding 5)				
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)				
	∠ Small Puddles/Depressions (∠ inches deep) ∠ Saturated soils present? If yes, year-round? _ Likely ∠ Unlikely _ Unk				
	Yes No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,				
ALCOHOL IIII	ponds, roads, beaver activity)? Witland is a mun made storm basin				
	Estimate time period (in years) of disturbance*: $_ \le 5 \times 6-10 $ $_ 11-20 $ $_ > 20$				
	For ditches that may be present, is there bog turtle habitat? If yes, describe:				
	None				

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland Type/Vegetation

Yes \times No Are there any signs of disturbance to <u>vegetation</u> {e.g., mowing, pasturing, burning}? If yes, describe:

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WeD- Weiker channey s. H loam

and the state of t	None	
How much suitable habitat is in this wetland? Estimate acreage or percentage: _	7 1 5 17 5	

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of We	tland:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. <i>Cornus</i> spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum Spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
withand is located in a man-made storm basin that contains
internitud water course
How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? Yone of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
None of it All of it Part of it (acres or% of the off-site portion)
Is there potential bog turtle habitat within 300 feet*?YesYesUnk Habitat off-site?YesNoUnk
If yes, how did you conclude this? Phase / burney was conducted n/in
300' of the Project area.
*Note that you must be permitted by the state you
Were any bog turtles observed? Yes No If yes, how many? **Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? **Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
Were any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
Were any bog turtles observed?YesNoIf yes, how many?
Were any bog turtles observed?YesNoIf yes, how many?
Were any bog turtles observed?YesYooIf yes, how many?
Were any bog turtles observed?YesYooIf yes, how many?
Were any bog turtles observed?Yes NoIf yes, how many?
Were any bog turtles observed? Yes No If yes, how many? **Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The soils criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). Yes No Unsure This wetland HAS potential bog turtle habitat. UNSURE if suitable habitat is present.
Were any bog turtles observed?YesXoIf yes, how many?
Were any bog turtles observed?Yes No If yes, how many? are conducting the survey in to handle bog turtles. Other herps observed?Yes No If yes, which ones?

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. PNDI # (for PA): 73 7860					
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area					
	Coordinates 40.422194, -76.574443 Project Type Cemetery Expansion/Upgrades					
	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.					
seneral Info	County/Township/Municipality East Hanover Township, Lebanon County					
פנים	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental					
	Other Assistants Present None					
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°					
Ĕ	Last Precipitation < 24 hours × 1-7 days > 1 week unknown Drought conditions? Yes × No					
	Unknown Drought Index*1 (Circle): none 100 D1 D2 D3 D4 Wetland Photos Taken X Yes No (Provide photo					
Date/Condition	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal					
Jare	conditions observed):					
_						
	Wetland Size 0.10 acres, if known #Wetlands w/in Project Area ² 19					
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+					
	Estimate % Canopy Cover*3 0% < 5 6-20 21-40 41-60 > 60					
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information					
	✓ Springs/Seeps Springhouse Trib/Stream Pond					
	Water Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)					
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)					
	Small Puddles/Depressions (inches deep)Saturated soils present? If yes, year-round?Likely Unlikely Unk					
	Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,					
2	ponds, roads, beaver activity)?					
Wetland Into						
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20					
	For ditches that may be present, is there bog turtle habitat? If yes, describe:					
	None					
	¹ (*) Denotes reference to the Supplemental Information document that provides more details on this particular question.					

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC	·W	-03	4

__Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

otland Inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

WED- weekers chancey self loom

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	1004.	NONE	N/A in.	N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wet	:land:		<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
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American Elm Ulmus americana	Đuck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolio	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	tnland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

_	Wetland ID: <u>/NC-W-03</u>
Des	cribe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
1	withand is located in diguessional topography in small we lot adjacent to moved maintained conclud grounds
	10+ adjacont to mand maintained constay growns
Но	w much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
ur	
it þ	art of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
	here potential bog turtle habitat within 300 feet* ? YesYNo Unk Habitat off-site ? Yes No Unk
lf y	es, how did you conclude this? Phase / survey was conducted when 300'
	of the Project Area
_	
	re any bog turtles observed?Yes 🔀 No If yes, how many? are conducting the survey in to handle bog tur
	re any bog turtles observed?Yes _XNo If yes, how many? are conducting the survey in to handle bog turter herps observed?Yes _XNo If yes, which ones? *Report bog turtle observations to your local F
Otl	re any bog turtles observed?YesXNo
Otl	re any bog turtles observed?YesXNoIf yes, how many? are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, which ones? *Report bog turtle observations to your local Field Office and state wildlife office within 48? YesXNoUnsureThe hydrology criterion for bog turtle habitat is met.
Otl	re any bog turtles observed?YesXNo
Otl	re any bog turtles observed?YesXNo
Otl	re any bog turtles observed?YesXNo
Otl	rer herps observed?YesXNoIf yes, which ones? *Report bog turtle observations to your local Field Office and state wildlife office within 48 hours. YesXNoUnsureThe hydrology criterion for bog turtle habitat is met. YesXNoUnsureThe soils criterion for bog turtle habitat is met. YesXNoUnsureThe vegetation criterion for bog turtle habitat is met. YesXNoUnsureThis wetland HAS potential bog turtle habitat (fair to good quality).
Otl	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, how many?
Otl	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, how many? are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, which ones?
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Oti	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, which ones?
Oti	are conducting the survey in to handle bog turner herps observed? _Yes _XNo
No.	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, which ones?
No Pr	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, how many?
No Da	are any bog turtles observed?YesXNoIf yes, how many? are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, which ones?
No Lee	are conducting the survey in to handle bog turner herps observed?YesXNoIf yes, how many?

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: //W-W-035 PNDI# (for PA): 737860
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
	Coordinates 40.423552, 76.57/282 Project Type Cemetery Expansion/Upgrades
	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
	County/Township/Municipality_East Hanover Township, Lebanon County
	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
	Other Assistants Present None
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°
	Last Precipitation < 24 hours \times 1-7 days > 1 week unknown Drought conditions? Yes \times No
	Unknown Drought Index *1 (Circle): none D0 D1 D2 D3 D4 Wetland Photos Taken X YesNo (Provide photo
	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
	conditions observed):
•	Wetland Size O.10 acres, if known # Wetlands w/in Project Area ² 19
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover*3 0% < 5 < 5-20 21-40 41-60 > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	∑ Springs/Seeps Springhouse ∑ Trib/Stream Pond ∑ Stormwater Iron Bacteria Watercress
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	Small Puddles/Depressions (inches deep)Saturated soils present? If yes, year-round?LikelyUnli
	Yes X No Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
	Estimate time period (in years) of disturbance*: < 56-1011-20 > 20
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None
	1 (*) Denotes reference to the Supplemental Information document that provides more details on this particular question.

in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID: INC-W-035

Yes XNo Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

Wetland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Bec- Buddinton snally silt loam

		NONE
How much suitable	e habitat is in this wetland? Estimate acreage or percentage:	

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	1004.	None	N/A in.	N/A in.
PSS Portion of Wetland:			<u>in.</u>	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wet	land:	<u> </u>	<u>in.</u>	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Buirush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail <i>Typha</i> spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	:
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Wetland ID: 1NC-W-035
Describe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
withand is located in a mooded to how how late about
wetland is located in a moded/shrubby lot adjuct to a heavily evuded intersitted drainage
to a heavily cruded internitual dianage
How much of this wetland is located off-site (i.e., outside the property boundaries or right-of-way)?
✓ None of it – the entire wetland is within the property boundaries
Some of it Acres or% of the wetland appears to be located off-site
If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
None of it All of it Part of it (acres or% of the off-site portion)
Is there potential bog turtle habitat within 300 feet*?YesYes No Unk Habitat off-site?Yes No <_ Unk
If yes, how did you conclude this? Phase I survey was conducted w/in 3001
of the Project area.
*Note that you must be permitted by the state you
Were any bog turtles observed? Yes XNo If yes, how many? are conducting the survey in to handle bog turtles.
Other herps observed? Yes No If yes, which ones? Report bog turtle observations to your local FWS Field Office and state wildlife office within 49 hrs.
YesYoo Unsure The hydrology criterion for bog turtle habitat is met.
Yes YNo Unsure The soils criterion for bog turtle habitat is met.
Yes XNo Unsure The vegetation criterion for bog turtle habitat is met. Yes XNo Unsure This wetland HAS potential bog turtle habitat (fair to good quality).
Yes XNo Unsure This wetland HAS potential bog turtle habitat (low to very low quality).

∠ This wetland does NOT have potential bog turtle habitat. Notes (How did you reach this opinion?):

dues not contain a mucky soul substrate

___ UNSURE if suitable habitat is present.

Lead Surveyor - please sign below certifying to the best of your knowledge that all of the information provided herein is accurate and complete.

Print Name Bridger Thompson

Signature Bolly Thy

Date 06/10/2021

Landscape Info

Species

ead Surveyor Opinion

Contact Information bthompson@thompsonesp.com, 717-609-3301

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in Guidelines for Bog Turtle Surveys for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in Guidelines for Bog Turtle Surveys).

	1 Bog Turtle Habitat Survey Data Form for the Northern Population Range d April 29, 2020) Please do not edit document. Wetland ID: //NC-W-03C
Proper	ty/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
Coord	nates 40.4232/5, -76.570849 Project Type Cemetery Expansion/Upgrades
Entity County	Requesting Phase 1 Survey Mabbett & Associates, Inc.
Count	y/Township/Municipality East Hanover Township, Lebanon County
Lead S	urveyor Bridger Thompson Affiliation Thompson Environmental
Other	Assistants Present None
Date o	f Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°
Last Pi	recipitation < 24 hours × 1-7 days > 1 week unknown Drought conditions? Yes × No
Unkno	wn Drought Index*1 (Circle): none DD D1 D2 D3 D4 Wetland Photos Taken Yes No (Provide photo
location	map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
	ons observed):
Modela	nd Size <u>0.37</u> acres, if known # Wetlands w/in Project Area ² <u>19</u>
	te wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	te % Canopy Cover*3 0%
	logy and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	rings/SeepsSpringhouseTrib/Stream X PondStormwaterIron BacteriaWatercress
	ater Visible on Surface Evidence of Flooding Yes No If yes, (Seasonal Flooding ⁴ Routine Flooding ⁵)
	vulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	nall Puddles/Depressions (inches deep)Saturated soils present? If yes, year-round?Likely Unlikely Unl
	S No _ Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
ponds,	roads, beaver activity)? Wetland is a man made impoundment
Estima	te time period (in years) of disturbance*: $_ \le 5$ $\times 6-10$ $_11-20$ $_ > 20$
For dit	ches that may be present, is there bog turtle habitat? If yes, describe:
,	Nonl
² Each	notes reference to the Supplemental Information document that provides more details on this particular question. wetland must have a separate Phase 1 habitat assessment data form completed. mine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent

Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
 Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

in the wetland and have the highest percent of coverage compared to other species.

1

Wetland ID:	INC-1	W.	-036
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__Yes $\frac{\cancel{X}}{\cancel{X}}$ No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

stland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Bec- Beddinton shaly sift loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:			<u>in.</u>	in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:		******	in.	<u>in.</u>
POW/PUB Portion of Wes	tland: 100 f.	None	N/A in.	N/A in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. <i>Alnus</i> spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush <i>Lindera benzoin</i>	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedg Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus colomus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex Interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

	Wetland ID:
Landscape Into	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? Very None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site If part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of itAll of itPart of it (acres or% of the off-site portion)
	Is there potential bog turtle habitat within 300 feet*?YesYnoUnk Habitat off-site?YesNoUnk
	If yes, how did you conclude this? Phase I survey was unducted who 300' of
	the Project Area.
salpade	Were any bog turtles observed?Yes ∠ NoIf yes, how many? *Note that you must be permitted by the state you are conducting the survey in to handle bog turtles. Other herps observed? ∠ Yes NoIf yes, which ones? *Report bog turtle observations to your local FWS Field Office and state wildlife office within 48 hrs.
	Yes
	Notes (How did you reach this opinion?): Withand 13 a man-made imprinded.
3	Lead Surveyor – please sign below certifying to the best of your knowledge that all of the information provided herein is

Print Name Bridger Thompson Signature ___ Date 06/10/2021

Contact Information bthompson@thompsonesp.com, 717-609-3301

Important Please include all Phase 1 data forms in a final Phase 1 bog turtle habitat assessment report (see Attachment 3 in Guidelines for Bog Turtle Surveys for checklist) and submit to your local state wildlife agency and U.S. Fish and Wildlife Service Field Office (see Attachment 1 in Guidelines for Bog Turtle Surveys).

	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C-W-037
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
	Coordinates 40.418551, -76.576.955 Project Type Cemetery Expansion/Upgrades
2	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
	County/Township/Municipality East Hanover Township, Lebanon County
5	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
	Other Assistants Present None
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°
5	Last Precipitation < 24 hours <1-7 days > 1 week unknown Drought conditions? Yes Mo
Jate/ Condition	Unknown Drought Index*1 (Circle): none 00 D1 D2 D3 D4 Wetland Photos Taken × Yes No (Provide photo
5	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
פוע	conditions observed):
	Wetland Size 0. 15 acres, if known #Wetlands w/in Project Area ² 19
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover* ³ 0% ≤ 5 6-20 21-40 41-60 > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	Springs/Seeps Springhouse $ imes$ Trib/Stream Pond $ imes$ Stormwater Iron Bacteria Watercress
	∠ Water Visible on Surface Evidence of Flooding ∠ Yes _ No If yes, (_ Seasonal Flooding⁴ _ Routine Flooding⁵)
	Rivulets (inches deep)Subsurface Tunnel/RivuletsTire Ruts (inches deep)
	$\underline{\times}$ Small Puddles/Depressions ($\underline{3}$ inches deep) $\underline{\times}$ Saturated soils present? If yes, year-round? $\underline{\times}$ Likely Unlikely Unk
	Yes No Are there any signs of disturbance to hydrology (e.g., drainage ditches, tile drainages, berms, culverts, fill material,
2	ponds, roads, beaver activity)? without is located in a men-made storm busine
Averiging 200	
	Estimate time period (in years) of disturbance*: $_ \le 5$ $_ 6-10$ $\times 11-20$ $_ > 20$
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	17.44
	NONE

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

 $\underline{\hspace{0.5cm}} \text{ Yes } \underline{\hspace{0.1cm}} \underline{\hspace{0.1cm}} \text{ No } \text{ Are there any signs of disturbance to } \underline{\hspace{0.1cm}} \underline{\hspace{0.1cm}} \text{ uegetation } (e.g., \text{mowing, pasturing, burning)? If yes, describe:}$

etland Info

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Ho-Holly silt loam

How much suitable habitat is in this wetland? Estimate acreage or percentage:

Wetland Type	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth
PEM Portion of Wetland:	1001	None	N/A in.	N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:			<u>in.</u>	<u>in.</u>
POW/PUB Portion of Wet	tland:		in.	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp.	Common Reed	Jewelweed	Rice Cutgrass	Spicebush	Willow spp.
Alnus spp.	Phragmites australis	Impatiens capensis	Leersia oryzoides	Lindera benzoin	Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead	Eastern Red Cedar	Poison Sumac	Shrubby Cinquefoil	Sweetflag	Yellow-Green Sedge
Sagittaria latifolia	Juniperus virginiana	Toxicodendron vernix	Dasiphora fruticosa	Acorús calamus	Cyperus esculentus
Carpetgrass	Eastern Tamarack	Porcupine Sedge	Skunk Cabbage	Tearthumb Spp.	
Axonopus fissifolius	<i>Larix laricina</i>	Carex hystericina	Symplocarpus foetidus	<i>Polygonum</i> spp.	
Cattail	Grass-of-Parnassus	Purple Loosestrife	, Smooth Sawgrass	Tussock Sedge	
Typha spp.	Parnassia glauca	Lythrum salicaria	Cladium mariscoides	Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describe surrounding landscape (e.g., wetlan				, ,
Withand is located	in a storm	surete.	basin	constructed
Wetland is located , along a heavily	ended inh	in Hn	drains	gl
How much of this wetland is located off-si t None of it – the entire wetl Some of it – Acres of this wetland continues off-site, he	and is within the property r% of the wetland a	/ boundaries ppears to be l	ocated off-site	e
None of it All of it				
s there potential bog turtle habitat within				
	sel survey we	us con	TIVETTA	Win 300'
of the Project 1	tria.			
Were any hog turtles observed? Yes	✓No If yes, how ma	anv?		e that you must be permitted by the so
Were any bog turtles observed?Yes ∠ Other herps observed?Yes ∠ No If Yes ∠ NoUnsure The hydroloYes ∠ NoUnsure The soils critYes ∠ NoUnsure The vegetatYes ∠ NoUnsure This wetlandYes ∠ NoUnsure This wetland	f yes, which ones? gy criterion for bog turtle terion for bog turtle habitation criterion for bog turtle that the bog turtle the bog turtle that the bog turtle the bog turtle that the bog turtle that the bog turtle	habitat is me at is met. e habitat is me habitat (fair t	et. o good quality	conducting the survey in to handle nog cort bog turtle observations to your loc Office and state wildlife office within the conduction of the cond
YesNoUnsure The hydroloYesNoUnsure The soils critYesNoUnsure The vegetat	f yes, which ones? gy criterion for bog turtle terion for bog turtle habit: ion criterion for bog turtle i HAS potential bog turtle d HAS potential bog turtle	habitat is me at is met. e habitat is me habitat (fair t habitat (low t	et. o good quality	conducting the survey in to handle pog cost bog turtle observations to your loc Office and state wildlife office within the conduction of the conduction of
YesNoUnsure The hydroloYesNoUnsure The soils criYesNoUnsure The vegetatYesNoUnsure This wetlandYesNoUnsure This wetlandYesNoUnsure This wetland	gy criterion for bog turtle terion for bog turtle habits ion criterion for bog turtle habits HAS potential bog turtle bog turtle bog turtle habitat.	habitat is metat is metat is met. habitat is methabitat (fair thabitat (low thabitat) UNSURE in the control of	et. o good quality o very low quality f suitable habit	conducting the survey in to handle pog cost bog turtle observations to your loc Office and state wildlife office within ality), tat is present.
Yes	gy criterion for bog turtle terion for bog turtle habits ion criterion for bog turtle habits HAS potential bog turtle bog turtle bog turtle habitat.	habitat is metat is metat is met. habitat is methabitat (fair thabitat (low thabitat) UNSURE in the control of	et. o good quality o very low quality f suitable habit	conducting the survey in to handle pog cost bog turtle observations to your loc Office and state wildlife office within ality), tat is present.
Yes	gy criterion for bog turtle terion for bog turtle habits ion criterion for bog turtle habits HAS potential bog turtle bog turtle bog turtle habitat.	habitat is metat is metat is met. habitat is methabitat (fair thabitat (low thabitat) UNSURE in the control of	et. o good quality o very low quality f suitable habit	conducting the survey in to handle pog cost bog turtle observations to your loc Office and state wildlife office within ality), tat is present.
Yes	f yes, which ones? Igy criterion for bog turtle terion for bog turtle habitation criterion for bog turtle HAS potential bog turtle bog turtle habitat. Withand IS NO P	habitat is metat is metat is met. e habitat is methabitat (fair thabitat (low thabitat) UNSURE in the company of the company	et. o good quality o very low qua f suitable habit	conducting the survey in to handle bog oper tog turtle observations to your local Office and state wildlife office within a life of the within the local office and state wildlife office within the local office within the l
Yes	f yes, which ones? Igy criterion for bog turtle terion for bog turtle habitation criterion for bog turtle HAS potential bog turtle bog turtle habitat. Withand IS NO P NO MU Ving to the best of your kn	habitat is metat is metat is met. e habitat is methabitat (fair thabitat (low thabitat) UNSURE in the cursus for the cursus f	et. o good quality o very low qua f suitable habit	porducting the survey in to handle bog set bog turtle observations to your local Office and state wildlife office within a life of the within state is present. The best contained by the best contai
Yes	f yes, which ones? Igy criterion for bog turtle terion for bog turtle habitation criterion for bog turtle HAS potential bog turtle bog turtle habitat. Withand IS NO P	habitat is metat is metat is met. e habitat is methabitat (fair thabitat (low thabitat) UNSURE in the cursus for the cursus f	et. o good quality o very low qua f suitable habit	porducting the survey in to handle bog set bog turtle observations to your local Office and state wildlife office within a life of the within state is present. The best contained by the best contai
Yes ∠ No Unsure The hydroloYes ∠ No Unsure The soils critYes ∠ No Unsure The vegetatYes ∠ No Unsure This wetlandYes ∠ No Unsure The vegetatYes ∠ No Unsure This wetlandYes ∠ No Unsu	gy criterion for bog turtle terion for bog turtle habitation criterion for bog turtle habitation criterion for bog turtle HAS potential bog turtle bog turtle habitat. WHAN DO THE HABITATE AND	habitat is metat is metat is met. e habitat is methabitat (fair thabitat (low thabitat) UNSURE in the cursus for the cursus f	et. o good quality o very low qua f suitable habit	porducting the survey in to handle bog set bog turtle observations to your local Office and state wildlife office within a life of the within state is present. The best contained by the best contai

Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: ///C-W-03 PNDI # (for PA): >37866
Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
Coordinates 40.42/182, 76.574895 Project Type Cemetery Expansion/Upgrades
Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
County/Township/Municipality East Hanover Township, Lebanon County
Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
Other Assistants Present_None
Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F° C°
Last Precipitation < 24 hours \times 1-7 days > 1 week unknown Drought conditions? Yes \times No
Unknown Drought Index*1 (Circle): none 100 D1 D2 D3 D4 Wetland Photos Taken Yes No (Provide photo
location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
conditions observed):
Wetland Size 6/0 acres, if known # Wetlands w/in Project Area ²
Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
Estimate % Canopy Cover*3 0% \leq 5 \times 6-20 21-40 41-60 > 60
Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
Springs/Seeps Springhouse $ imes$ Trib/Stream Pond $ imes$ Stormwater Iron Bacteria Watercress
Water Visible on Surface Evidence of Flooding \angle Yes No If yes, (Seasonal Flooding Routine Flooding S)
Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
Small Puddles/Depressions (inches deep) 🚜 Saturated soils present? If yes, year-round? Likely 🔀 Unlikely Unl
Yes XNo Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
Estimate time period (in years) of disturbance*: < 56-1011-20 > 20
For ditches that may be present, is there bog turtle habitat? If yes, describe:
None

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.
⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

in the wetland and have the highest percent of coverage compared to other species.

¹

Wetland ID:	INC-W	038

__ Yes _XNo Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

atland inf

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed⁶ 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

Ho- Holly silt loans

How much suitable habitat is in this wetland? Estimate acreage or percentage: _____

NONE

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck	Avg. Muck Depth	Max. Muck Depth N/A in.
PSS Portion of Wetland:			in.	<u>in.</u>
PFO Portion of Wetland:		*****	in.	<u>in.</u>
POW/PUB Portion of Wet	tland:		in.	in.

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impatiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoil Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack <i>Larix laricina</i>	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	(seages)
Cattail Typha spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	Inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. Viburnum spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

Describ	e surroun	ding landsca	pe (e.g., wetla	nds, forest, su	bdivision, agricu	ultural field,	fallow field, e	tc.):		
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	UF	The pr	oject i	Arca.						
		=.						*Note that you must		
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Other	herps obse	erved?Ye	es ⊻No I	f yes, which	ones?			*Report bog turtle of	urvey in to hand oservations to y	lie bog turti our local FV
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	Phase 1 Bog Turtle Habitat Survey Data Form for the Northern Population Range (Revised April 29, 2020) Please do not edit document. Wetland ID: /NC-W-039 PNDI # (for PA): 737866
	Property/Project Name Indiantown Gap National Cemetery Expansion Project- Additional Project Area
	Coordinates 40. 420 337, -76. 576 480 Project Type Cemetery Expansion/Upgrades
General Info	Entity Requesting Phase 1 Survey Mabbett & Associates, Inc.
neral	County/Township/Municipality East Hanover Township, Lebanon County
e G	Lead Surveyor Bridger Thompson Affiliation Thompson Environmental
	Other Assistants Present None
	Date of Survey 06/10/2021 Time In 07:00 Time Out 15:00 Air Temp. 75 F ° C°
E .	Last Precipitation < 24 hours × 1-7 days > 1 week unknown Drought conditions? Yes × No
nditi	Unknown Drought Index*1 (Circle): none 00 D1 D2 D3 D4 Wetland Photos Taken Yes No (Provide photo
Date/Condition	location map) Notes (e.g., details about drought, flood, abnormally dry, and/or snow/ice conditions, and any other seasonal
Date	conditions observed):
	Wetland Size 0.001 acres, if known # Wetlands w/in Project Area ² /9
	Estimate wetland size (acres) < 0.1 0.1 - 0.5 0.5 - 1 1 - 2 2 - 4 5+ 10+
	Estimate % Canopy Cover*3 0% $\frac{X}{X} \le 5$ 6-20 21-40 41-60 > 60
	Hydrology and Soils (check all that apply): use additional pages to further discuss pertinent general wetland information
	Springs/Seeps Springhouse Trib/Stream Pond Stormwater Iron Bacteria Watercress
	Water Visible on Surface Evidence of Flooding 🔀 Yes No If yes, (Seasonal Flooding ⁴ 🔀 Routine Flooding ⁵)
	Rivulets (inches deep) Subsurface Tunnel/Rivulets Tire Ruts (inches deep)
	Small Puddles/Depressions (inches deep)Saturated soils present? If yes, year-round? Likely <u>*</u> Unlikely Unk
٥	Yes KNO Are there any signs of disturbance to <u>hydrology</u> (e.g., drainage ditches, tile drainages, berms, culverts, fill material, ponds, roads, beaver activity)?
d Inf	
Wetland Info	
š	
	Estimate time period (in years) of disturbance*: ≤ 56-1011-20 > 20
	For ditches that may be present, is there bog turtle habitat? If yes, describe:
	None

^{1 (*)} Denotes reference to the Supplemental Information document that provides more details on this particular question.

 $^{^{\}rm 2}$ Each wetland must have a separate Phase 1 habitat assessment data form completed.

³ Determine percent cover of abundant species for the wetland, not by wetland type. Abundant species are those that are most prominent in the wetland and have the highest percent of coverage compared to other species.

⁴ Seasonal flooding in wetlands/streams can occur as a result of spring snow melt/heavy rain that increases water levels in these systems.

⁵ Routine flooding refers to tidally-influenced wetland/stream systems or the occurrence of normal rain patterns throughout the year.

Wetland ID:	INC-W-039	7
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Yes X No Are there any signs of disturbance to <u>vegetation</u> (e.g., mowing, pasturing, burning)? If yes, describe:

of backto

Wetland Type/Vegetation

Rate (scale of 1-4) level of vegetation disturbance* (Circle): 1. Light to moderate grazing or mowing 2. No grazing, mowing, burning observed 3. Moderate to high grazing or mowing 4. Mowing occurs during bog turtle active season

Soil types present*:

BrB- Brinketen Silt loans

How much suitable habitat is in this wetland?	Estimate acreage or percentage:	NORE	
TOTAL MINERAL CONTRACTOR OF THE CONTRACTOR OF TH	E211111010 CO. 00B- C. Po. 001110801		

Wetland Type PEM Portion of Wetland:	% of Total Wetland	% of Wetland Type w/Muck Ninl	Avg. Muck Depth	Max. Muck Depth
PSS Portion of Wetland:	***************************************		in.	in.
PFO Portion of Wetland:	*****		in.	in.
POW/PUB Portion of Wes	tland:		in:	<u>in.</u>

CIRCLE all vegetation* from list below that is dominant (≥ 20% for each wetland type listed above) and add other species you observe that are not listed in table in the "notes" space provided below or in the extra table cells.

Alder Spp. Alnus spp.	Common Reed Phragmites australis	Jewelweed Impotiens capensis	Rice Cutgrass Leersia oryzoides	Spicebush Lindera benzoin	Willow spp. Salix spp.
Alder-leaved Buckthorn Rhamnus alnifolia	Dogwood Spp. Cornus spp.	Mile-A-Minute Persicaria perfoliata	Rough-leaved Goldenrod Solidago patula	Spike-Rush Eleocharis palustris	Woolly-fruited Sedge Carex lasiocarpa
American Elm Ulmus americana	Duck Potato Sagittaria latifolia	Multiflora Rose Rosa multiflora	Sensitive Fern Onoclea sensibilis	Swamp Rose Rosa palustris	Woolly Bulrush or Woolgrass Scirpus cyperinus
Arrowhead Sagittaria latifolia	Eastern Red Cedar Juniperus virginiana	Poison Sumac Toxicodendron vernix	Shrubby Cinquefoll Dasiphora fruticosa	Sweetflag Acorus calamus	Yellow-Green Sedge Cyperus esculentus
Carpetgrass Axonopus fissifolius	Eastern Tamarack Lorix laricina	Porcupine Sedge Carex hystericina	Skunk Cabbage Symplocarpus foetidus	Tearthumb Spp. Polygonum spp.	(sedges)
Cattail Typho spp.	Grass-of-Parnassus Parnassia glauca	Purple Loosestrife Lythrum salicaria	Smooth Sawgrass Cladium mariscoides	. Tussock Sedge Carex stricta	
Cinnamon Fern Osmundastrum cinnamomeum	inland sedge Carex interior	Red Maple Acer rubrum	Soft Rush or Common Rush Juncus effusus	Viburnum Spp. <i>Viburnum</i> spp.	
Common Boneset Eupatorium perfoliatum	Japanese Stiltgrass Microstegium vimineum	Reed Canary Grass Phalaris arundinacea	Sphagnum Moss Sphagnum spp.	White turtlehead Chelone glabra	

⁶ No grazing, mowing, or burning is given a "2" rank as this is considered more harmful to bog turtle wetlands than Rank 1 (light to moderate grazing or mowing). Light to moderate habitat management is beneficial to suppressing succession of native and non-native plant species.

D	escribe surrounding landscape (e.g., wetlands, forest, subdivision, agricultural field, fallow field, etc.):
	without is located in a depressional area at the edge
	of a moved maintained cenetary grounds withandis
	located at the beginning of an evoded ditch
ŀ	How much of this wetland is located off-site (<i>i.e.</i> , outside the property boundaries or right-of-way)? X None of it – the entire wetland is within the property boundaries Some of it – Acres or% of the wetland appears to be located off-site
ŀ	f part of this wetland continues off-site, how much of the off-site portion was surveyed (on foot)?
	None of it All of it Part of it (acres or% of the off-site portion)
ı	s there potential bog turtle habitat within 300 feet* ?YesYNoUnk Habitat off-site ?YesNoYUnk
ŀ	fyes, how did you conclude this? Phase! Survey was renducted afin 30 of the project Area.
_	Nere any bog turtles observed?Yes 🔀 No If yes, how many? are conducting the survey in to handle bog turtle
\	*Note that you must be demitted by the state y are conducting the survey in to handle bog turtle Nere any bog turtles observed? Yes No If yes, how many? ** Other herps observed? Yes No If yes, which ones? ** *Report bog turtle observations to your local FW Field Office and state wildlife office within 48 hrs
(Nere any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtle Other herps observed? Yes No If yes, which ones?
(Nere any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtle Dther herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local PM Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The solls criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality).
	Nere any bog turtles observed? Yes No If yes, how many? are conducting the survey in to handle bog turtle Other herps observed? Yes No If yes, which ones? *Report bog turtle observations to your local PM Field Office and state wildlife office within 48 hrs. Yes No Unsure The hydrology criterion for bog turtle habitat is met. Yes No Unsure The solls criterion for bog turtle habitat is met. Yes No Unsure The vegetation criterion for bog turtle habitat is met. Yes No Unsure This wetland HAS potential bog turtle habitat (fair to good quality). Yes No Unsure This wetland HAS potential bog turtle habitat (low to very low quality). This wetland does NOT have potential bog turtle habitatUNSURE if suitable habitat is present.
	Are conducting the survey in to handle bog turtle observed? Yes No If yes, how many?

Attachment C

Photo Log



Date:

1

06/10/21

Feature ID:

Existing Conditions

Direction:

Southwest

Description:

View of the existing conditions in the mowed maintained cemetery grounds.



Photograph:

Date:

2

06/10/21

Feature ID:

Wetland INC-W-021

Direction:

South

Description:

View of the vegetative conditions in wetland INC-W-021.



Photograph: Date:

3

06/10/21

Feature ID:

Wetland INC-W-022

Direction:

North

Description:

View of the vegetative and surface water conditions in wetland INC-W-022.



Photograph: Date:

1

06/10/21

Feature ID:

Wetland INC-W-023

Direction:

North

Description:

View of wetland INC-W-023.



Date:

5

06/10/21

Feature ID:

Wetland INC-W-024

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-024.



Photograph:

n: Date:

6

06/10/21

Feature ID:

Wetland INC-W-025

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-025.



Date:

7

06/10/21

Feature ID:

Wetland INC-W-025

Direction:

N/A

Description:

View of the mucky soil substrate and hydrologic conditions in wetland INC-W-025.



Photograph:

Date:

8

06/10/21

Feature ID:

Wetland INC-W-026

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-026.



Date:

9

06/10/21

Feature ID:

Wetland INC-W-027

Direction:

Northwest

Description:

View of the vegetative conditions in wetland INC-W-027.



Photograph: Date:

10

06/10/21

Feature ID:

Wetland INC-W-028

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-028.



Date:

11

06/10/21

Feature ID:

Wetland INC-W-029

Direction:

North

Description:

View of wetland INC-W-029.



Photograph:

Date:

12

06/10/21

Feature ID:

Wetland INC-W-030

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-030.



Date:

13

06/10/21

Feature ID:

Wetland INC-W-031

Direction:

South

Description:

View of wetland INC-W-031.



Photograph: D

Date:

14

06/10/21

Feature ID:

Wetland INC-W-032

Direction:

West

Description:

View of the vegetative conditions in the swale portion of wetland INC-W-032.



Date:

15

06/10/21

Feature ID:

Wetland INC-W-032

Direction:

West

Description:

View of the vegetative conditions in the wooded lot portion of wetland INC-W-032.



Photograph:

Date:

16

06/10/21

Feature ID:

Wetland INC-W-033

Direction:

North

Description:

View of the man-made basin identified as wetland INC-W-033.



Date:

17

06/10/21

Feature ID:

Wetland INC-W-034

Direction:

Northwest

Description:

View of the vegetative conditions in wetland INC-W-034.



Photograph:

Date:

18

06/10/21

Feature ID:

Wetland INC-W-035

Direction:

East

Description:

View of the vegetative conditions in wetland INC-W-035.



Photograph:

Date:

19

06/10/21

Feature ID:

Wetland INC-W-036

Direction:

West

Description:

View of the impoundment identified as wetland INC-W-036.



Photograph:

Date:

20

06/10/21

Feature ID:

Wetland INC-W-037

Direction:

Southwest

Description:

View of the man-made storm water structure identified as wetland INC-W-037.



Photograph: Date: 21 06/10/21

Feature ID:

Wetland INC-W-038

Direction:

Southwest

Description:

View of vegetative conditions in wetland INC-W-038.



Photograph: Date:

22 06/10/21

Feature ID:

Wetland INC-W-039

Direction:

Southwest

Description:

View of vegetative conditions in wetland INC-W-039.



ATTACHMENT 4 PNDI # 737860

Project Search ID: PNDI-737860

1. PROJECT INFORMATION

Project Name: Final Indiantown Gap National Cemetery Phase 5 Expansion

Date of Review: 7/9/2021 02:59:43 PM

Project Category: Development, Additions/maintenance to existing development facilities

Project Area: 147.28 acres

County(s): **Lebanon**

Township/Municipality(s): EAST HANOVER TOWNSHIP; UNION TOWNSHIP

ZIP Code:

Quadrangle Name(s): INDIANTOWN GAP

Watersheds HUC 8: Lower Susquehanna-Swatara

Watersheds HUC 12: Bow Creek-Swatara Creek; Reeds Run-Swatara Creek

Decimal Degrees: 40.423303, -76.560872

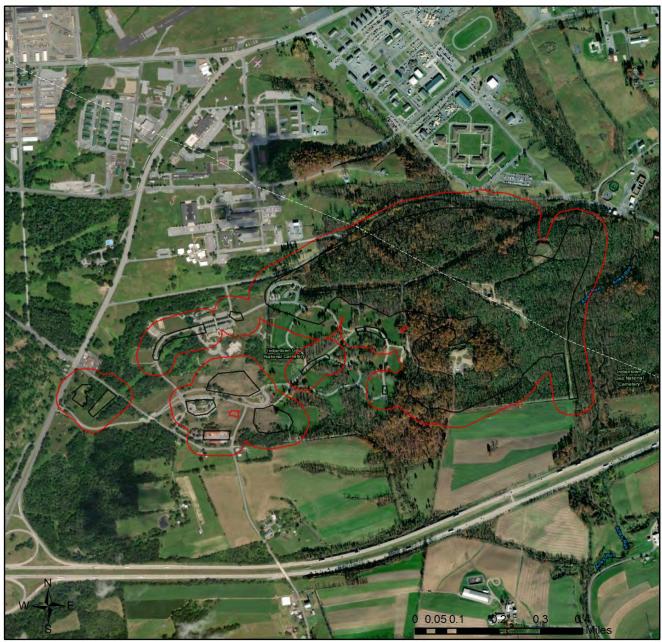
Degrees Minutes Seconds: 40° 25' 23.8910" N, 76° 33' 39.1392" W

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Final Indiantown Gap National Cemetery Phase 5 Expansion

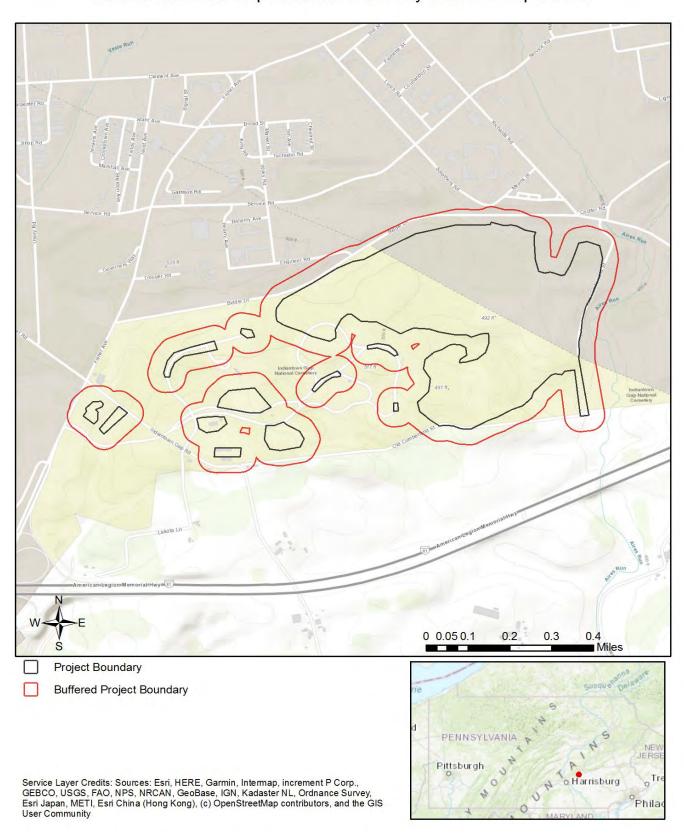


Project Boundary

Buffered Project Boundary

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

Final Indiantown Gap National Cemetery Phase 5 Expansion



RESPONSE TO QUESTION(S) ASKED

Q1: Which of the following closest describes the proposed project?

Your answer is: A well or other groundwater extraction (e.g., groundwater pumping to facilitate mining, pump-and-treat operation) is proposed as part of this project, or in order to support some aspect of the project, and more than 1000 gallons per day will be extracted.

Q2: Are there any perennial or intermittent waterways (rivers, streams, creeks, tributaries) in or near the project area, or on the land parcel?

Your answer is: Yes

Q3: Describe how wastewater (effluent) will be handled (select one). For the purpose of this question, wastewater/effluent does not include stormwater runoff. If the project involves solely the renewal or modification of an existing discharge permit (e.g., NPDES permit), select from options 3, 4, 5, or 6 below.

Your answer is: All wastewater/effluent from this project/activity will be routed to an existing municipal wastewater treatment plant.

Q4: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.

Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

3. AGENCY COMMENTS

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

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

PA Game Commission RESPONSE:

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

PA Department of Conservation and Natural Resources RESPONSE:

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

PA Fish and Boat Commission RESPONSE:

Project Search ID: PNDI-737860

Project Search ID: PNDI-737860

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

U.S. Fish and Wildlife Service **RESPONSE:**

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).

*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:

Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.

A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)

In addition to the materials listed above, USFWS REQUIRES the following

SIGNED copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.

Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)

Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

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

Project Search ID: PNDI-737860

5. ADDITIONAL INFORMATION

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

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

6. AGENCY CONTACT INFORMATION

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U.S. Fish and Wildlife Service

Pennsylvania Field Office Endangered Species Section 110 Radnor Rd; Suite 101 State College, PA 16801 Email: <u>IR1_ESPenn@fws.gov</u>

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7. PROJECT CONTACT INFORMATION

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City, State, Zip: Washington, D.C. 20	0001	1/1956		
Phone:(202) 632-5529	Fax:()	-5129 [S)	
Email: fernandez@va.gov	>7\X			
8. CERTIFICATION				
I certify that ALL of the project inform	nation contained in	this receipt (inc	cluding project location,	project
size/configuration, project type, answ	vers to questions) is	s true, accurate	e and complete. In addit	ion, if the project type
location, size or configuration change	es, or if the answer	s to any questi	ons that were asked du	ring this online review
change, I agree to re-do the online e	nvironmental revie	W.		
applicant/project proponent signature)		date	

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PHASE I ARCHAEOLOGICAL SURVEY
FOR THE PROPOSED PHASE 5 EXPANSION AT
THE INDIANTOWN GAP NATIONAL CEMETERY,
ANNVILLE, EAST HANOVER TOWNSHIP,
LEBANON COUNTY, PENNSYLVANIA

PROJECT NUMBER 2021PR03892

CONTAINS PRIVILEGED INFORMATION –
DO NOT RELEASE

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PHASE I ARCHAEOLOGICAL SURVEY FOR THE PROPOSED PHASE 5 EXPANSION AT THE INDIANTOWN GAP NATIONAL CEMETERY, ANNVILLE, EAST HANOVER TOWNSHIP, LEBANON COUNTY, PENNSYLVANIA

PROJECT NUMBER 2021PR03892

FINAL REPORT

MICHAEL B. HORNUM, PH.D. PRINCIPAL INVESTIGATOR

 \mathbf{BY}

MICHAEL B. HORNUM, PH.D. AND THOMAS WAMBACH, M.A.

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JUNE 2021

FOR

MABBETT & ASSOCIATES, INC. 40 OLD LOUISQUISSET PIKE, SUITE 200, BOX 13 NORTH SMITHFIELD, RHODE ISLAND 02896

EXECUTIVE SUMMARY

his report presents the results of the Phase I archaeological survey for the proposed Phase 5 Expansion at the Indiantown Gap National Cemetery, Annville, East Hanover Township, Lebanon County, Pennsylvania. The project is located on federal property. As a federal undertaking, it will be reviewed under Section 106 of the National Historic Preservation Act of 1966. All work was completed following standards promulgated in *Archaeology and Historic Preservation: The Secretary of the Interior's Standards and Guidelines*, and in the revised *Guidelines for Archaeological Investigations in Pennsylvania* (PA SHPO 2017).

The Phase I survey was undertaken by R. Christopher Goodwin & Associates, Inc. (RCG&A) on behalf of Mabbett & Associates, Inc. from April 20 – 23, 2021. Approximately 8.5 acres (3.4 hectares) of the area of potential effects (APE) has been surveyed for archaeological

resources previously and reviewed by the Pennsylvania State Historic Preservation Office (PA SHPO), and were not resurveyed. RCG&A completed a pedestrian reconnaissance of the remaining approximately 21.5 acres (8.7 hectares) of the APE. In undisturbed areas of 15 percent slope or less, systematic survey was undertaken using shovel tests excavated at 15 m (49.2 ft) intervals. Geomorphological review had indicated that no deep testing was needed. A total of 224 shovel tests were excavated. No archaeological artifacts were recovered and no archaeological sites were identified.

Since no artifacts were recovered and no archaeological sites were identified within the proposed project area, the proposed project will have no impact to archaeological historic properties, as defined in 36 CFR 800.16(1), in the studied areas. No further archaeological investigation is warranted or recommended.

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CHAPTER I

Introduction

I archaeological survey for the proposed Phase 5 Expansion at the Indiantown Gap National Cemetery, Annville, East Hanover Township, Lebanon County, Pennsylvania (Figure 1). The project is located on federal property. As a federal undertaking, it will be reviewed under Section 106 of the National Historic Preservation Act of 1966. All work was completed following standards promulgated in *Archaeology and Historic Preservation: The Secretary of the Interior's Standards and Guidelines*, and in the revised *Guidelines for Archaeological Investigations in Pennsylvania* (PA SHPO 2017).

Project Location and Description

The U.S. Department of Veterans Affairs (VA) National Cemetery Administration (NCA) is proposing to construct and operate the Phase 5 expansion within the existing Indiantown Gap National Cemetery. The undertaking consists of the construction and operation of the Phase 5 cemetery expansion within an approximately 30-acre (12.1-hectare) area of potential effects (APE) (Figure 2). The Phase 5 expansion would provide burial capacity for approximately the next 10 years. Within the proposed Phase 5 expansion area boundary, the undertaking would provide new casket, columbarium, and in-ground cremation burial sites for veterans. Additionally, development would provide physical infrastructure improvements including new roadways to connect existing and new burial areas; new stormwater management features; extension of the irrigation utility; and landscaping at the new burial areas.

Research Objectives and Design

The objectives of the Phase I survey investigation were: (1) to locate, identify, and delin-

eate all prehistoric and historic cultural resources within the project area; (2) to make preliminary assessments of the potential significance of those resources, applying the National Register Criteria for Evaluation [36 CFR 60.4 (a-d)]; (3) to assess the impact of proposed development activities on the cultural resources situated within the project boundaries; and (4) to formulate management recommendations concerning those resources. These objectives were accomplished through a combination of archival research and archaeological investigations that included systematic sub-surface shovel testing.

Project Personnel

The Phase I survey was undertaken by R. Christopher Goodwin & Associates, Inc. (RCG&A) on behalf of Mabbett & Associates, Inc. from April 20 – 23, 2021. Michael B. Hornum, Ph.D., served as Principal Investigator and Project Manager, and supervised all aspects of the study. Field investigations were directed by Thomas Wambach, M.A., and also included the participation of Kevin Clark, B.A., Dan Grose, B.A., and Hanah Romsburg, B.A. Kristopher R. West, M.A. was the project geomorphological consultant. Archival investigations were undertaken by Katherine Grandine, M.A.

Organization of the Report

Chapter I contains a brief description of the project. The natural and cultural settings of the project area are described in Chapter II, which also contains a discussion of previous research in the vicinity. Chapter III reviews the research methods used in these investigations. Chapter IV presents the results of the Phase I investigations. Chapter V summarizes the report and presents management recommendations. Appendix I contains resumes of key project personnel.

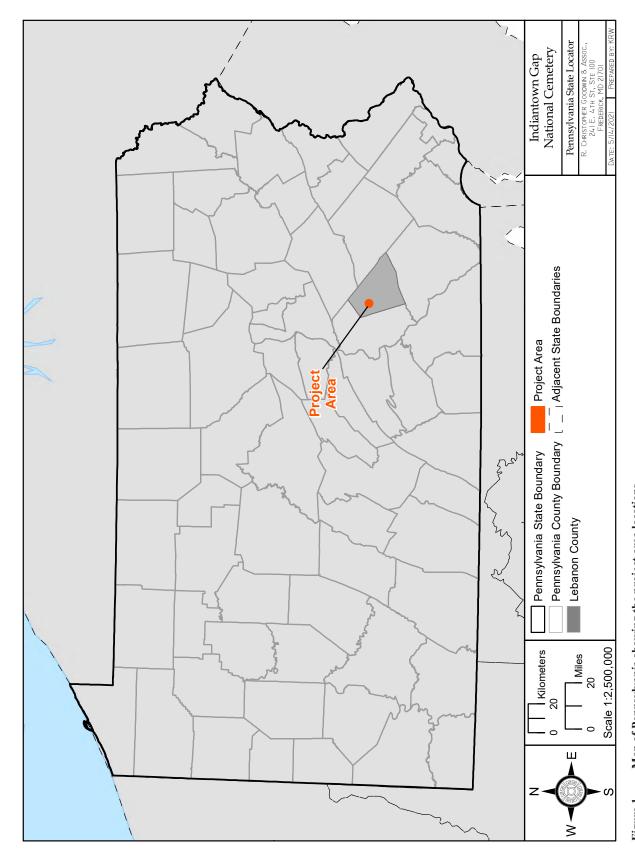


Figure 1. Map of Pennsylvania showing the project area locations

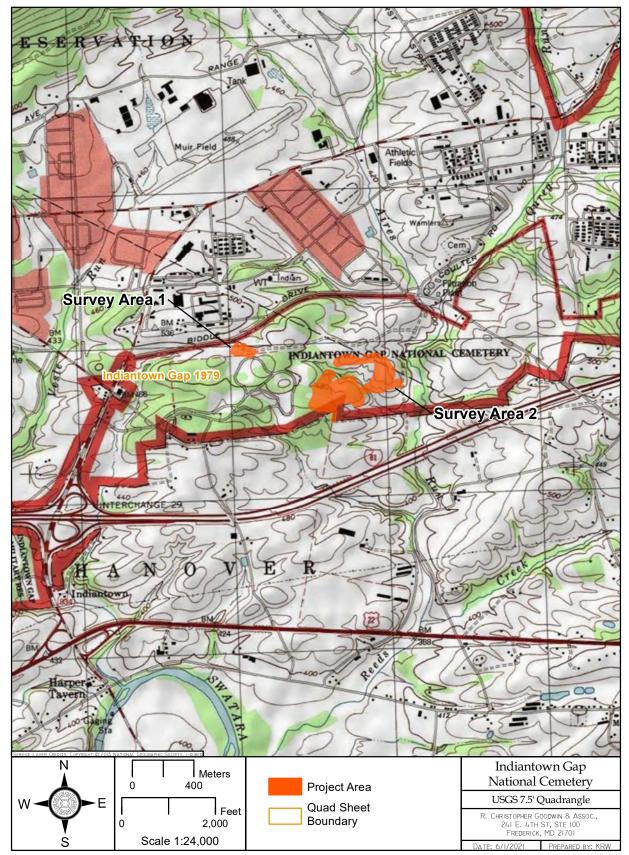


Figure 2. Excerpts from the USGS 7.5 minute 1979 Indiantown Gap, Pennsylvania quadrangle showing the proposed project area in Lebanon County

CHAPTER II

NATURAL AND CULTURAL SETTING

The Indiantown Gap National Cemetery property is located in Lebanon County, Pennsylvania, roughly 10 miles (mi) (16 kilometers [km]) northwest of the city of Lebanon. The major elements of the natural environment were important determinants of both prehistoric and historic settlement and subsistence patterns in the Susquehanna River watershed. Specific environmental parameters, such as geology, soils, and relative proximity to water, affected the quantity and variety of resources accessible to prehistoric populations. The earliest Euro-American settlers venturing into the region likewise sought out soils with properties advantageous to particular agricultural practices, selecting parcels neighboring major waterways, or emerging arterial road systems to facilitate trade and commerce. Thus, factors of climate, distribution of fauna and flora, the nature and distribution of soils, terrain and topography, and proximity to aquatic resources all have determined in part where people have settled and how they have exploited their surroundings (Evans 1978).

Physiography and Geology

The Indiantown Gap National Cemetery lies within the Great Valley section of the Ridge and Valley physiographic province (Pennsylvania Archaeological Research Unit 2). The terrain for the project area is characterized by ridges and slopes adjacent to unnamed tributaries of Qureg Run. Ground surface elevations range from approximately 420 to 514 ft (128 to 157 m) above mean sea level.

The bedrock deposits that underlie the Indiantown Gap National Cemetery property are composed of sediments of unequal hardness that crumpled and subsequently uplifted; erosion cut away valleys, leaving the harder strata as ridges. The bedrock deposits derive from four periods of geological development. Bedrock underlying the

valley floors is Ordovician in age and includes shale, sandstone, limestone, and dolomite. The red and gray sandstones, conglomerates, and shales of the lower ridge slopes date from the Silurian period, while Devonian red sandstone, gray and black shales, limestone, and chert form the upper slopes. Ridgetop bedrock deposits are comprised of sandstone, shale, clay, coal, and limestone of the Mississippian and Devonian periods (Willard 1933:12, Map 7). A list of lithic resources that would have been available for prehistoric utilization included bedded and nodular cherts from the limestone and dolomite formations within the Great Valley; cobbles of quartz, quartzite, and metabasalt deposited by high order steams like the Susquehanna River; rhyolite in the Great Valley to the southwest; and jasper deposits located in Lehigh and Berks Counties to the north and east (Stewart 1980:7-8; Hatch et al. 1985:98).

Soils

The major soil association occurring within the Indiantown Gap National Cemetery study area is identified as the Berks-Weikert-Bedington Association (Holzer 1981). Soils of this association occupy convex tops, side slopes, and foot slopes of dissected ridges and hills in the west-central and northern portion of Lebanon County, and are formed from acid shale, sandstone, and siltstone (Holzer 1981:4 – 5). The soil series mapped in the project area include Bedington shaly silt loam, 3 to 8 percent slopes (BeB) and 15 to 25 percent slopes (BeD), Berks channery silt loam, 3 to 8 percent slopes (BkB), Comly silt loam 3 to 8 percent slopes (CmB), and Weikert channery silt loam, 3 to 8 percent slopes (WeB) and 15 to 25 percent slopes (WeD) (USDA NRCS 2021). The representative profiles for the soil series, as encountered in the field, are discussed with reference to the survey results in Chapter IV below.

Drainage and Hydrology

The project area falls within Lower Susquehanna (7) Watershed D (Swatara Creek sub-basin). The project area is drained by Qureg Run, which flows southward into Reeds Creek, which eventually empties into the Swatara Creek, a major tributary of the Susquehanna River.

Vegetation and Climate

Current vegetation in the project area included wooded areas that were mainly mixed deciduous trees, with some scattered conifers, and manicured grassy lawns. Humid, continental weather conditions characterize the climate of Lebanon County. Systems developed over the central United States, or Atlantic Ocean are mitigated significantly before reaching the project area. The city of Lebanon has recorded average daily maximum temperatures of 37°F in January and 86°F in July. Documented annual average precipitation at Lebanon is 42.3 inches (in) (107.4 centimeters [cm]), and is evenly distributed throughout the year. The frost-free growing season comprises 176 days, and typically extends from the end of April through mid-October (Holzer 1981:3).

Previous Cultural Resources InvestigationsWatershed and Pre-Contact Predictive Model

The project area is located in Watershed 7D of the Lower Susquehanna River. The smaller watershed sub-basin associated with Swatara Creek currently features 60 archaeological sites recorded in Pennsylvania's State Historic and Archaeological Resource Exchange (PA-SHARE) (https://share.phmc.pa.gov/pashare). PA-SHARE also depicts Pre-Contact model probabilities of the APE. The model generally classifies the project area has having a moderate to high potential for Pre-Contact sites, with 61 percent having moderate potential, 20.7 percent high potential, and 18.3 percent no coding or presumed low potential.

<u>Previous Survey and Previously Recorded Sites</u> and Built Resources

Portions of the current project area, measuring approximately 8.5 acres (3.4 hectares) in total, are overlapped by a previous 2010 survey by MACTEC (Avery 2010; A.D. Marble and

MACTEC 2012). This survey was conducted for a proposed expansion of the Indiantown Gap National Cemetery, and included two alternatives that totaled 36.5 acres (14.8 hectares). Three archaeological sites were identified and are discussed below. Three other surveys are located within 0.5 mi (0.8 km) of the current project area. These studies included an addendum archaeological survey for proposed training facilities at the National Guard Training Center at Fort Indiantown Gap (French 2001), a larger archaeological survey for the National Guard Training Center at Fort Indiantown Gap (Hunter 2007), both located north of the current study, and a small archaeological survey for a sewer south of the current project area (Young 2003).

The project area mostly is within the Fort Indiantown Gap Historic District (Key # 107363), which the PA SHPO has determined to be eligible for the inclusion on the National Register of Historic Places (NRHP). Previous survey has resulted in the recordation of 15 archaeological sites within a 0.5 mi (0.8 km) radius of the project (Table 1). Nine of the sites were prehistoric period occupations and six of the sites were historic period occupations. Four sites have been determined by the PA SHPO to not be eligible for inclusion on the NRHP, ten of the sites have not been evaluated for eligibility for the NRHP, and one has been destroyed. Two sites, 36LE0516 and 36LE0517, are located within or immediately adjacent to the project footprint. Both of these sites have been determined by the PA SHPO to not be eligible for inclusion on the NRHP. Site 36LE0518, located southwest of one of the current project area, is an historic house site that was considered potentially NRHP eligible by the surveyors (Avery 2010; A.D. Marble and MACTEC 2012). Prehistoric components, when identifiable by time period, include the Late Archaic, Transitional, and Late Woodland periods, while historic sites range from the nineteenth to twentieth centuries.

Prehistoric Cultural Sequence

Prehistoric cultural periods recognized for Pennsylvania traditionally have included the Paleo-Indian (ca. 13,000 – 8,000 B.C.), Archaic (ca. 8,000 – 1,000 B.C.), the Woodland (ca. 1,000 B.C. – A.D. 1500), and Contact (ca. A.D. 1500 –

Table 1. Previously recorded archaeological sites located within 0.5 mi (0.8 km) of the proposed project area

						•		
Site Number	Site Name	Site Type	Chronological	Topographic	Level of	Investigation	NRHP Status / Determination of	Comments/
		:	reriod	Setting	Investigation	Method	Eligibility (DOE)	Sources
36LE0030	Unknown	Open Habitation, Pre-Contact	Unknown Prehistoric Stream bench	Stream bench	Amateur	Collection	Unevaluated	
36LE0031	Unknown	Open Habitation, Pre-Contact	Archaic, Transitional Stream bench	Stream bench	Amateur	Collection	Unevaluated	
36LE0032	Unknown	Open Habitation, Pre-Contact	Archaic, Transitional Terrace	Terrace	Amateur	Collection	Unevaluated	
36LE0033	Unknown	Open Habitation, Pre-Contact	Archaic, Late Archaic, Transitional	Stream bench	Amateur	Collection	Unevaluated	
36LE0034	Unknown	Open Habitation, Pre-Contact	Woodland	Terrace	Amateur	Collection	Destroyed	
36LE0052	Unknown	Open Habitation, Pre-Contact	Transitional, Late Woodland	Stream bench	Amateur	Collection	Unevaluated	
36LE0053	Unknown	Open Habitation, Pre-Contact	Unknown Prehistoric Hill ridge/toe	Hill ridge/toe	Amateur	Collection	Unevaluated	
36LE0361	Unknown	Open Habitation, Pre-Contact	Unknown Prehistoric Steam bench	Steam bench	Amateur	Collection	Unevaluated	
36LE0501	FS-06-22	Historic Domestic Site	19th century	Not listed	Phase I	Shovel testing	Unevaluated	
36LE0502	FS 06-25	Historic - Unknown/Other/Multiple 19th - 20th centuries Not listed Types	19th - 20th centuries	Not listed	Phase I	Not listed	SHPO: Not Eligible	Low density
36LE0503	FS 06-26	Historic - Unknown/Other/Multiple Unknown Historic Types		Not listed	Phase I	Not listed	SHPO: Not Eligible	Low density
36LE0516	Indiantown Gap National Cemetery 2	Historic - Unknown/Other/Multiple 20th century Types		Middle slopes	Phase I	Shovel testing	SHPO: Not Eligible	
36LE0517	Indiantown Gap National Cemetery 3	Open Habitation, Pre-Contact	Unknown Prehistoric Upper slopes	Upper slopes	Phase I	Shovel testing	SHPO: Not Eligible	
36LE0518	Gerberich/ Bomberger	Historic Farmstead	19th century	Hill ridge/toe	Phase I	Shovel testing	Unevaluated	
36LE0566	Gerberich Site	Historic Farmstead	19th - 20th centuries	Not listed	Phase I	Not listed	Unevaluated	

1750). Originally developed as cultural historical units, these traditions are defined by diagnostic artifact forms and assemblages. In recent years this scheme has been adjusted, with an emphasis on cultural adaptations to changing ecological conditions modifying a system primarily intended to treat temporal and spatial questions. As a result, the various terms continue to be used, but their use is now as much behavioral as classificatory.

Although the terms "Paleo-Indian," "Archaic," and so on are the same throughout the eastern United States, the corresponding use of McKern's (1939) Midwestern Taxonomic Method, even as revised by Willey and Phillips (1958), has been abandoned over most of the Mid-Atlantic region. In Pennsylvania especially, this was a conscious decision by Witthoft (e.g., 1952), who found it more useful to substitute the term "period" for "tradition." Recently this has been systematized to some extent by Custer (1984) who, in addition to the term "period," uses "complex" to replace "phase." This alternative to McKern's system is well established in the regional literature and is the basis of Pennsylvania's State Plan for the Conservation of Archaeological Resources (Raber 1985a, 1985b).

More recently, many archaeologists (e.g., Custer 1996) have combined these periods into new groupings on cultural and ecological grounds. In particular, Custer (1985, 1996), Gardner (1980), and Stewart (1980) all have combined the traditional Paleo-Indian period with the Early Archaic. Earlier dates for the onset of the traditionally defined Paleo-Indian period currently are in a state of flux, particularly since the discovery of a pre-Clovis or "proto-Clovis" component at the Cactus Hill site in Sussex County, Virginia (Boyd 2003:68). Custer (1996) has proposed to group the Paleo-Indian and Early Archaic as Hunter-Gatherer I, described the Middle Archaic as Hunter-Gatherer II, posited the Late Archaic and Traditional as Intensive Gathering-Formative Culture Period I, changed the Early - Middle Woodland to Intensive Gathering-Formative Cultural Period II, and transformed the Late Woodland into the Village Life Cultural Period. The following synthesis of prehistoric cultural change follows the diachronic framework proposed by Custer (1996), and it utilizes data from the Ridge and Valley physiographic province of Pennsylvania, as well as from similar geomorphologic settings within neighboring areas of the Middle Atlantic region.

Paleo-Indian/Early Archaic (ca. 13,000 - 6,500 B.C)

This period corresponds to Custer's (1996) Hunter-Gather I Cultural Period. The Paleo-Indian/Early Archaic period is defined as the time from about 13,000 B.C. to 6,500 B.C. The somewhat early designation for the onset of this period is seen as a median date falling between the earliest dates advanced by researchers such as Adovasio (et al. 1977) and later dates proposed by more conservative investigators (Custer 1985:27). The 13,000 B.C. time frame also corresponds with C-14 and other dates recently obtained for the pre-Clovis levels at the Cactus Hill site (Boyd 2003:68). Technologically, the earliest, pre-Clovis phases of this period have been documented as a collection of blade flakes, possibly utilized as tools, from the Cactus Hill site. Traditionalists mark the onset of the Paleo-Indian period with the appearance of the Clovis, Mid-Paleo, and Dalton projectile point styles. Diagnostic point types after 8,000 B.C. include the side-notched and corner-notched projectile points traditionally assigned to the Early Archaic, including the Palmer, Charleston, Amos, and Kirk cornernotched point types (Gardner 1980:3: Custer 1996:96). Despite these apparent technological and stylistic differences in projectile point manufacture, investigations conducted at the Flint Run Paleo-Indian Complex in the Shenandoah Valley suggest a continuity of general adaptive patterns throughout this period (Gardner 1979, 1983).

In North America, the Paleo-Indian period is defined as the way of life associated with the earliest, terminal Pleistocene human inhabitants. It has been commonly believed that these people migrated from eastern Siberia into the Northern Great Plains by way of an ice free corridor thought to have existed in western Canada between the Cordillarian and Laurentide ice sheets. The time for this initial occupation was thought to be around 13,000 B.P., based on two sets of evidence. First, access along the ice free corridor

was thought to be possible only between 13,500 - 11,850 B.P. Second, the earliest agreed upon evidence of a human presence in North America occurred at a series of mammoth kill sites in the southwestern United States. These sites, located directly south of the southern end of the ice free corridor, returned radiocarbon dates that all fell between 11,650 - 11,000 B.C.

Contained within those kill sites was a distinctive type of fluted spear point, a Clovis point, examples of which had been found in every state in the United States, in every country in Central America, and in most countries in South America. In most of those cases, however, the Clovis points were not in datable contexts (if they were in context at all, which was seldom the case outside of the western United States). Consequently, the interpretation of the so called Clovis sites in the western United States came to be applied to all situations in which Clovis points occurred.

Clovis points were, and often still are, viewed as associated with small bands of migratory hunters who focused on Pleistocene megafauna, particularly proboscinians: mammoths in the western United States, mastodons in the eastern United States. This association of large Pleistocene game with Clovis points was reinforced by the simultaneous disappearance of both around 11,000 B.C., a disappearance that led Martin (1967) to propose that the extinction of the megafauna was a consequence of overkill by the people using the Clovis points.

In the western United States there was a switch after 11,000 B.C. to the hunting of bison, which continued as late as 8,500 B.C. and is considered part of the Paleo-Indian period. In the eastern United States, it is believed that there was a similar switch, although one focusing on the use of forest resources. This would be considered the start of the Archaic Tradition.

The reason that Hatch et al. (1985) combines Paleo-Indian with Early Archaic is that the general interpretation of the Paleo-Indian Tradition breaks down in the eastern United States. Traditionally the earliest that people could have been in North America, given a migratory path between the ice sheets, was 11,850 B.C. when the ice free corridor was thought to have closed due to what was termed the Valderan readvance. Re-

examination of the stratigraphic evidence for the Valderan by Evenson et al. (1976) indicated that it never happened: There was no advance; there was no quick opening and closing of access to the Northern Plains. In addition, dates were obtained from occupations in the East: 12,570 B.P. from Duchess Quarry Cave in New York (Funk et al. 1969); 12,010 B.C. from Little Salt Spring in Florida (Clausen et al. 1979); and 16,175 B.C. from Meadowcroft Rockshelter in western Pennsylvania (Adovasio et al. 1977). Of these, the most telling is the date from Little Salt Spring in Florida, which indicated that people had been present in that area long enough to develop the cultural practices necessary to survive in what was then a xerophytic ecosystem.

In addition to the evidence suggesting a much older (if not longer) occupation in the eastern United States, there is still no known association of Paleo-Indian artifacts with Pleistocene megafauna in the eastern United States. There is also little direct evidence about subsistence. Griffin (1977) summarized the general feeling that hunting was probably the most important subsistence activity, and this is consistent with the caribou remains from Duchess Quarry Cave. The ascription of hunting, however, remains based on a functional interpretation of stone tools that were analyzed before the advent of high-magnification analysis (Keeley 1980). The results from the Shawnee-Minisink Site in northeastern Pennsylvania (Kauffman and Dent 1982) do not contradict the idea of hunting, although there is sufficient evidence to indicate the use of blackberry, ground-cherry, and hawthorn plum as well as fish.

The image that is now emerging, which forms the basis of the cultural adaptive model used by Hatch et al. (1985), is one analogous to the Subarctic cultures like the Ojibwa (Rogers 1962), Cree (Rogers 1969), and Slave (Honigmann 1946) on the Canadian Shield. These have dispersed family hunting groups during the late fall, winter, and early spring, with a focus on hunting and trapping. From the late spring through the early fall the family hunting groups gather at fish spawning sites, and it is during that time that plant foods high in ascorbic acid, such as blackberry, are collected. Subarctic peoples

tend to operate in well defined, if extensive territories, and Eisenberg's (1978; cf. Stewart 1979) interpretation of raw material acquisition for Clovis points in the Delaware basin suggests that this may have been the case for Paleo-Indians as well.

The environmental setting for this 8,500-year time span was conditioned by the Late Pleistocene/Holocene transition. Climatic episodes defined by Carbone (1976) for the Shenandoah Valley are broadly applicable to the study area (Kavanagh 1982). Climatic episodes include the Late Glacial (ca. 15,000 - 8,500 B.C.) and the Pre-Boreal/Boreal (8,500 - 6,700 B.C.) (Custer 1984, Kavanagh 1982).

The Late Glacial episode represents the Terminal Pleistocene and the "last effects of the glaciers upon climate in the Middle Atlantic area" (Custer 1984:44). Pollen data and faunal remains suggest a mosaic of varied environments, including grasslands mixed with coniferous spruce-pine forest, and deciduous forest along streams, rivers, and wetlands (Carbone 1976; Watts 1983; Custer 1996:97-98). In the Piedmont areas of eastern Pennsylvania, grasslands would have been restricted to swampy floodplains, scattered upland bogs, and specialized soil areas, and deciduous forest would have dominated the major river terraces (Custer 1996:98). Carbone (1976) described Late Glacial vegetation in the Shenandoah Valley, which is continuous with the Great Valley in Maryland and Pennsylvania, as composed of microhabitats, including mixed deciduous gallery forests near the rivers, mixed coniferous-deciduous forest and grasslands in the foothills and on valley floors, coniferous forest on the high ridges, and alpine tundra in the mountains (Kavanagh 1982:8).

The Pre-Boreal/Boreal climatic episode was a period of transition from the late Pleistocene into the full Holocene. Climatic change involved warmer summer temperatures and continued wet winters, and vegetation shifted in response. In the Shenandoah Valley, the period was characterized by "the expansion of coniferous and deciduous elements and a reduction in open habitats" (Carbone 1976:186). Similarly, eastern Pennsylvania saw a reduction of open grasslands and a spread of forests dominated with pine, spruce, and some oak (Custer 1996:99-100).

Gardner (1979, 1983) has identified distinctive site types in the Shenandoah Valley Paleo-Indian settlement system, and Custer (1984, 1996) has suggested that these types may be more widely applicable to the entire Middle Atlantic region, including eastern Pennsylvania. The site types include: (1) quarry sites, located at lithic outcrops or cobble beds; (2) quarry reduction stations, on level ground near quarries; (3) base camps, including quarry-related base camps near stream confluences within 1 - 2 km of quarries, and nonquarry base camps, centrally located within areas of maximum game availability; (4) base camp maintenance stations, at game-attractive locations within a 3 km radius of a base camp; and (5) outlying hunting stations, located more than 3 km from base camp locations (Custer 1985:31; 1996:108-109). Isolated point finds also are frequent. If a Subarctic culture analog is applicable, the only site type missing is a large warm season fishing camp that, if preserved, would be in the floodplain sediments. Sites in eastern Pennsylvania include seasonal riverine base camps, interior quarry sites, and upland hunting stations.

The largest documented Paleo-Indian site in Pennsylvania, the Shoop Site in Dauphin County, east of the Susquehanna River, does not support Gardner's model. Carr (1989) notes that the Shoop Site is located far from potential lithic sources; this settlement may have served as a spot for the hunting of a variety of migratory game. Several Paleo-Indian and Early Archaic sites have been identified in floodplain and terrace settings along the Delaware River, and at quarries, low-order streams, springs, and sinkholes.

The riverine sites include the Shawnee-Minisink Site, the Upper Shawnee Island Site (36MR45), and the Harry's Farm Site in the Upper Delaware River Valley, as well as Site 36BU44 in the Middle Delaware River Valley (Custer 1996:110-115). While Site 36BU44 has yielded fluted points, the assemblage from the Shawnee-Minisink Site (36MR43) produced a richer assemblage of Paleo-Indian and Early Archaic materials (McNett 1985). The Paleo-Indian levels yielded radiocarbon dates of 8800+/-600 B.C. and 8640+/-300 B.C., as well as hearths, lithic reduction areas, a Clovis point, side and endscrapers, spokeshaves, retouched flakes; flake

knives, discoidal and tabular cores, and hammerstones. Various types of carbonized seeds and fish bones were recovered from the hearths (Dent and Kauffman 1985). The Early Archaic deposits recovered from the site produced a more diverse lithic artifact assemblage, including a greater variety of lithic raw material types, than those recovered from the Paleo-Indian phase. Plant remains from the Early Archaic occupations indicated a continuity of resource exploitation with the earlier Paleo-Indian phase (Dent and Kauffman 1985).

The Early Archaic, then, is seen to be a continuation of Paleo-Indian in the sense that it represents populations responding to the collapsing spruce and spruce-pine forests (Dumont 1981). The low carrying capacity of these forests, combined with the changing ecological community, are seen by Funk and Wellman (1984) as the reasons for the low frequency of Early Archaic sites in the upper Susquehanna basin.

Middle Archaic (6,500 – 3,000 B.C.)

This period corresponds to Custer's (1996) Hunter-Gather II Cultural Period. Custer (1985, 1996) departs from the traditional tripartite division of the Archaic period. In addition to expanding the previously accepted chronological parameters of the Middle Archaic, dating the period between ca. 6,500 and 3,000 B.C. (Stewart and Cavallo 1991), Custer also includes the traditional Late Archaic subperiod (ca. 3,000 - 1,000 B.C.) with the Early and Middle Woodland periods, labeling them the "transitional phase" (Custer 1985) or the "Intensive Gathering-Formative Culture Period" (Custer 1996).

The Archaic Tradition in the eastern United States generally refers to pre-ceramic sites associated with the nomadic hunter-gatherer populations that occupied the emerging Holocene deciduous forests. The Woodland period was originally defined by the appearance of ceramics and the assumed presence of maize and sedentary villages, since at the time the term was devised (the 1930s) it was believed that ceramics, agriculture/horticulture, and village life were mutually inclusive.

Linking the Archaic and Woodland is the Transitional Period, first defined by Witthoft (1953) and restricted in appellation to the ar-

chaeology of the northeastern and mid-Atlantic regions of the United States. The Transitional Period is exactly what the name suggests: a time during which the life styles associated with the Archaic began to switch over to those associated with the Woodland. Research over the last two decades has revealed that, with the exception of pottery manufacture, the changes in cultural adaptation from the Archaic through the Woodland were not as great as first thought, being more of a degree in the efficiency of using deciduous forest resources than in the kind of resources used (Caldwell 1958; Ford 1974; Custer 1984). The Middle Archaic - Early Woodland Phase, as set forth by Hatch et al. (1985), reflects the current understanding of a progressively improving cultural adaptation to a deciduous forest ecosystem.

The majority of species typical of the modern temperate deciduous forest were re-established across the eastern United States between 8,500 B.C. and 4,000 B.C., depending on the type of tree and location being considered. The one general feature that all of the eastern forests have in common is the large number of oak present. This ranges from around 30 percent of the mature fruiting canopy trees in the maple-beech forests of Ohio and Indiana to 60 percent in the oakchestnut forests that existed along the east coast (Braun 1950). Combining the oak with other nut trees like hickory, chestnut, and beech (walnut seldom makes up more than 2 percent of a mature deciduous forest); these forests represented a vast abundance of food. The autumn nut crop is now, and in all likelihood was in the past, at the base of most food chains in the eastern forest ecosystem, the productivity of which directly determines the population size and reproductive rates of deer, raccoon, turkey, and squirrel.

The Middle Archaic represents the inception of what Caldwell (1958) termed primary forest efficiency. Caldwell stressed the vast bounty and variety of food sources in the eastern forests, noting that prehistoric peoples need only have moved to the proper location during a given season to maximize resource acquisition. Thus, in the eastern United States in general the Middle and Late Archaic is seen to represent mobile hunting gathering peoples who were exploiting seasonal resources and scheduling their movements accord-

ingly: tree nuts (mast), deer, and waterfowl in the fall; deer and small game in the winter; small game and waterfowl in the spring; and fish in the summer. In many parts of the southeastern and midwestern United States the Middle Archaic is also associated with large freshwater bivalve middens.

Human groups of the Archaic period were adjusting to evolving Post-Pleistocene mesic oak-hemlock forest environments. More heterogeneous faunal and floral communities were available for exploitation in the moderating climate of the Holocene (Raber 1985b:11). Archaic lifeways were characterized by a broadening of the subsistence base, which presumably included a greater reliance on small game, fish, shellfish, and plant foods (Cleland 1976). New technologies and tools, including grinding stones, axes, and adzes, accompanied these changes. A wider of variety of lithic materials was used during the Middle Archaic than during earlier periods, including more frequent use of non-cryptocrystalline materials such as argillite, quartzite, quartz, and rhyolite (Stewart and Cavallo 1991:30-34).

The major temporally diagnostic artifacts for the Middle Archaic have been divided into three chronological groups, at least in eastern Pennsylvania (Custer 1996:134 – 145). During the early part of the period (ca. 6,500 - 5,500 B.C.) the dominant point types are bifurcates (Kanawha, LeCroy, St. Albans), and Kirk stemmed. During the period from ca. 5,500 – 4,500 B.C., various stemmed and notched types are common, including the Morrow Mountain I and II, Otter Creek, Stark, Vosburg, and Piney Island types. The late Middle Archaic (ca. 4,500 - 3,000 B.C.) is represented by types that continue into the Late Archaic, such as the Lamoka, Halifax and Kittatinny types, and the Brewerton series. The earliest triangular projectile points/knives, including the so-called Hunterbrook type, have been found in Middle Archaic contexts (Stewart and Cavallo 1991:25, 31).

Groundstone tool technology makes its initial appearance in the assemblages from Middle Archaic sites. In addition to this change in technology is a notable shift in lithic raw material preference. Previously, exploitation was focused exclusively on high quality cryptocrystalline ma-

terials; in the Middle Archaic Period, exploitation patterns appear to emphasize the expedient use of locally available lithic materials, such as rhyolite, local chert and other comparatively low grade materials for tools. Grooved axes, atlatl weights, and milling stones support the idea of increased importance of plants in the diet.

Human populations appear to have increased during the Archaic Period. According to Kratzer et al. (1987:7-8), the increased occurrence of bifurcated-base projectile points during the early Middle Archaic period may have been related to the development of new subsistence strategies geared to the emerging deciduous forests and their resources. The increase in human populations may have led to more intensive utilization of specific territories and to greater reliance upon more localized sources of lithic raw materials. Custer (1996:155-156) currently recognizes two major types of sites associated with the Middle Archaic: the base camp, which includes Custer's earlier (1985) macro-band and micro-band base camps, and the procurement site. Stewart and Cavallo (1991:29-30) suggest a significant focus on interior and riverine wetland areas.

Evidence of Middle Archaic settlement in central Pennsylvania is limited to small collections of projectile points taken from the surfaces of multi-component sites. These Archaic components indicate "a pattern of widely scattered, relatively small occupations" (Archaeological and Historical Consultants 1987:3-4). Lithic procurement in the Adams and Franklin counties region probably focused on the abundant rhyolite sources available at the interface of the Uplands and the Ridge and Valley provinces. As early as 1933. Henry Deisher wrote about a rhyolite Indian quarry located "ten miles southwest of Gettysburg" (Deisher 1933:18-19). Frost's (1935) survey of Adams County point collections showed that over 90 percent of the projectile points recovered from sites within the county were fabricated from gray rhyolite, while an additional 2.9 percent were made of red rhyolite (Frost 1935:20).

Late Archaic (3,000 – 1,000 B.C.)

Following Witthoft (1953), Custer (1985:36) combined the time periods traditionally labeled Late Archaic, Early Woodland, and Middle

Woodland, into one culturally distinct chronological unit that he has termed "Transitional." Recently, Custer (1996:163) has re-termed this period the Intensive Gathering-Formative Culture Period, and designated the earlier stages of this period as Intensive Gathering-Formative Culture Period I.

During the earlier phases of this expanded period, human adaptation in Pennsylvania required increasingly specialized hunting and gathering practices. Sites that focused principally on the procurement of mast or fish began to appear in the archaeological record. Base camp settlements were located near reliable surface water, on floodplains and terraces near rivers and high order streams, and appear to have been repeatedly reoccupied seasonally (Custer 1996:187-189). Evidence suggests that a number of other sites were frequented regularly for scheduled subsistence and other tasks. The resultant small transient camps are found in several kinds of upland and lowland settings within restricted territories, and contain varied tool assemblages (Raber 1985b; Kratzer et al. 1987:8; Custer 1996:189).

Technological changes during the Late Archaic include an increase in the number and variety of groundstone tools, including axes, celts, adzes, pestles, and net weights. These artifacts, together with steatite vessels, bespeak a greater reliance on plant resources and fish than in previous periods. The caching of artifacts suggests that sites were repeatedly revisited. The appearance of storage pits implies longer-term occupations, and the use of large platform hearths may be associated with fish processing (Custer 1996:183-187). Stewart (1988) and others argue that Late Archaic peoples initiated the first concerted exchange of goods in the Middle Atlantic region, perhaps in response to the marked territoriality of the period. Rhyolite from the South Mountain area of the Pennsylvania and Maryland Blue Ridge, argillite from the Middle Delaware Valley, and steatite from the Pennsylvania and Maryland Piedmont all have been found in eastern and central Pennsylvania (Custer 1996:190).

Two cultural traditions have been identified in Pennsylvania during the Late Archaic: Laurentian (Ritchie 1965) and Piedmont (Kinsey 1972). Both traditions have been identified primarily

through the distribution of projectile point styles (Dragoo 1959; Michaels and Smith 1967). The Laurentian tradition is associated with notched Laurentian points, including Brewerton Corner Notched, Brewerton Ear Notched, Brewerton Side Notched, Lamoka, Otter Creek, and Vosburg (Gravbill 1993; Justice 1987; Ritchie 1961). The Piedmont Tradition is associated with narrow bladed, stemmed projectile points, including Bare Island (Kinsey 1959; Ritchie 1961); Lackawaxen Stemmed (Kinsey 1972); Lamoka (Ritchie 1961); Merrimack Stemmed (Dincauze 1976); Normanskill (Ritchie 1961); Squibnocket Stemmed (Ritchie 1965); Sylvan Stemmed and Side Notched (Funk 1965); Wading River (Ritchie 1965); and other stemmed varieties. In Pennsylvania, the two traditions may reflect broad territories of Late Archaic hunters and gatherers, with those of the Laurentian tradition focused on the mixed deciduous and coniferous forests of northern regions of the state, and those of the Piedmont tradition concentrated in the varied hardwood forests in the southern portion of the state (Custer 1996:190).

During the Late Archaic/Early Woodland Transitional period (2,000-1,000 B.C.), ceremonial objects such as gorgets, bannerstones, and birdstones appeared for the first time. Mortuary ceremonialism also has been associated with this period. Cremated burials with grave goods, including steatite vessels presumably filled with food offerings, have been identified in formal cemeteries at sites dating to this period throughout the northeast United States [New England (Dincauze 1968); New Jersey, New York, and Pennsylvania (Hawkes and Linton 1916; Regensburg 1970; Ritchie 1959)].

Pottery also first appears in the archaeological record during the Transitional Period. Marcey Creek Plain, a steatite tempered with plain exterior surface, has been recovered from Orient Phase Transitional Archaic Period sites (Manson 1948; Smith 1971). Vessel forms mimic the steatite bowls from earlier periods. Some researchers associate the appearance of Marcey Creek Plain ceramics with increasing sedentism and the need for longer-term storage capacity (Gardner 1981; Ritchie 1965). Although the introduction of ceramic technology has been used to mark a

transition between the Archaic and Woodland periods it has become apparent that ceramics were adopted at widely different times, even by groups in the same region. Therefore the latter portion of the Late Archaic and the early portion of the Early Woodland period may be characterized as a Transitional Period.

Transitional period sites, like those of the Late Archaic, are found in riverine alluvial deposits and in upland locations, suggesting a continuation of Late Archaic lifeways that included a broad-based subsistence pattern founded essentially on forest and riverine products (Dragoo 1959). However, settlement in upland and interior areas decreased. The increase in floodplain settlements may be due to the transition towards semi-sedentism (Gardner 1981; Kinsey 1972; Turnbaugh 1975, 1977; Witthoft 1953), or an increased reliance on streams and rivers for water travel and trade networks.

Early Woodland (1,000 - 500 B.C.)/ Middle Woodland (500 B.C. - A.D. 1000)

The remainder of Custer's Intensive Gathering-Formative Culture Period (Intensive Gathering-Formative Culture Period II) encompasses what traditionally has been known as the Early and Middle Woodland phases. Trends previously associated with the Late Archaic period appear to have intensified during this time. Early and Middle Woodland peoples relied increasingly on riverine food resources, covering relatively long distances in their subsistence pursuits (Mayer-Oakes 1955; Archaeological and Historical Consultants 1987:3-5).

Fishtail points/knives already had occurred in deposits from the last portion of the Late Archaic, and they also commonly are found with the earliest ceramic types that mark the Early Woodland period. Fishtail points/knives traditionally have been associated with the so-called Transitional or Orient Phases (Kinsey 1972:355-361; Kraft 1975:41). Other temporally diagnostic lithic artifacts for the Early Woodland include the Adena, Hellgrammite, and Meadowood point/knife types, as well as various stemmed and notched points that appear to represent continuations of the broadspear and Normanskill types common in the later part of the Late Archaic.

Middle Woodland diagnostic point/knife types include the Jack's Reef pentagonal, Jack's Reef corner-notched, Fox Creek stemmed, Rossville, and Snyder's Dovetail types. Towards the end of the Middle Woodland period, triangular points/knives, which become the dominant Late Woodland form, begin to appear (Custer 1996:227-232), likely in association with the more widespread inclusion of bow-and-arrow technologies in Woodland subsistence patterns.

The traditional Early Woodland (1,000 B.C. - A.D. 200) and Middle Woodland (A.D. 200 -1000) periods are marked by a more intensive use of ceramics. The earliest ceramics generally were steatite tempered. One such ceramic type, Marcey Creek ware, has been recovered from sites across the entirety of the state of Pennsylvania. By ca. 800 B.C., regional variations appear. In the Susquehanna Valley, ceramic variation has permitted the definition of two cultural complexes - the Bare Island during the Early Woodland and the Three Mile Island during the Middle Woodland (Custer 1996:244-247). The former has yielded a variety of ceramic types including the steatite tempered Bare Island cordmarked and the crushed quartz tempered Vinette I and Accokeek wares (Custer 1996:219-227). The latter is associated with crushed quartz tempered Susquehanna net and fabric impressed, sand/grit tempered Susquehanna cord-marked and Popes Creek, and later shell tempered Mockley, sand/ grit Point Peninsula, and advanced mica-schist tempered and grit/sand tempered corded varieties (Custer 1996:219-227).

Regional settlement patterns show that during the Early and Middle Woodland periods, floodplains and terraces along major and minor drainages were the foci of multifamily base camps. Platform hearths continue to appear. Large numbers of small hearths, deep storage pits, and refuse pits occur at these base camps. Above ground lodges constructed of post supports and semi-subterranean pit dwellings both have been documented on various sites from the period. Hatch et al. (1985) propose a "multiple base camp/radial pattern secondary site model," similar to the kind suggested by Custer (1984, 1987). Base camps would be located on valley floors, in places that would maximize access to

as many different microenvironmental zones as possible. Radiating out from those base camps and located in each of those zones would be special and/or limited activity campsites, the function of which would have been to provide the raw materials needed for everyday activities life at the base camp. This kind of settlement pattern was common across the eastern and midwestern United States, being well documented in Illinois (Roper 1979), Wisconsin, and Iowa (Alex 1980).

There are no well defined Adena, Meadowood or Middlesex sites in eastern Pennsylvania, but there is some evidence from sites in the Susquehanna Valley for participation in Adena and Hopewell related trade networks. For example, pipes and birdstones typical of Adena and Meadowood sites do occur in caches or associated with cremation burials. Some stone burial mounds also have been identified (Custer 1996:246).

The Middle Woodland, at least at the start, appears to be a continuation of the Late Archaic - Early Woodland trajectory of increasing population, social organizational complexity, and material culture elaboration. The subsistence base remained the same as that found in the Late Archaic: heavy use of tree nuts; continued use of indigenous cultigens; selective or preferential predation on those terrestrial fauna most involved in the feeding on tree nuts; extensive fishing; and the hunting of waterfowl. The late Middle Woodland represents the abandonment of at least millennia of elaboration. Ceramics are often described as poorly made and decorated (e.g., Griffin 1952 ed.). The extensive trading network disappeared. In the Midwest the evidence suggests a return to egalitarian sociopolitical organizations: tribes and bands. The population appears to have declined.

No special reference is made by Hatch et al. (1985) to Middle Woodland settlement patterns for the Ridge and Valley Province, and the best that can be said for the moment is that, like earlier times, there were seasonally occupied base camps located in lowland areas, and a series of limited activity sites scattered throughout tributary drainages. Thematically this is a "hollow exploitation model," discussed most recently by Stevenson (1982) for Pennsylvania. Consistent

with Fehr (1983), Middle Woodland base camps sites in somewhat similar ecological settings in the forested Midwest tend to be found at the base of slopes (Struever 1968).

Research in the upper Susquehanna generally is consistent with the Hatch et al. (1985) model. Funk and Rippeteau (1977) discuss eleven Late Archaic through Middle Woodland sites. Of the 63 components encountered, 56 (88.9 percent) were located directly along the Susquehanna at the time of occupation. Many of these contained indirect evidence of fishing, usually in the form of netsinkers. Botanical remains often included black walnut (Juglans nigra) shells, indicative of a floodplain orientation. Funk and Rippeteau (1977) suggest that during the Late Archaic the sites were occupied in the spring and/or summer, but by the Middle Woodland they were being used in the fall and/or winter. This interpretation was based on the presence of the charred nutshells, which they evidently felt were processed and consumed at the time of collection.

Late Woodland (A.D. 1000 - 1500)

Custer (1996) has designated this period as the Village Life Cultural Period. The Late Woodland is generally used to denote egalitarian, tribal, village-dwelling populations dependent to some extent on maize. The appearance of the Late Woodland, or the emergence of the lifestyle evidenced by Late Woodland sites, corresponds with both the sudden adoption of maize as food by peoples in the eastern United States (ca. A.D. 850 in the lower Mississippi basin to ca. A.D. 1000 elsewhere). This also corresponds to the start of the Neo-Atlantic climatic optimum.

With a relatively moderate climate compared to preceding centuries as well as a longer growing season, the amount of energy available in the eastern forest ecosystems increased. The late Middle Woodland Tradition appears to have included values premised on a lower energy flow, such that human populations increased during the Neo-Atlantic. This was a case of climatically induced system enrichment, a common byproduct of which is population growth (Frisch 1978). The increased energy flow represented by a more moderate climate, combined with an additional food source within the system -- maize

-- that was more efficient in converting solar energy to biomass than the native temperate plants, appear to have literally fueled increased cultural elaboration. The previous subsistence regime was not abandoned. Tree nuts still formed an important part of the diet. The prey selectively hunted -- deer, turkey, raccoon -- are equally heavy consumers of maize as they are of tree nuts. Fishing and fowling persist. However, of the earlier indigenous cultigens, only sunflower would continue in use.

Around A.D. 1200 - 1250 the climate again started to shift into a minimum, with cooler annual temperatures and shorter growing seasons. This minimum, known as the Pacific I Episode in North America, corresponds globally to major cultural changes. Populations decreased; fortification of villages increased. It is at this time that Late Woodland peoples in the northeastern United States began to locate their villages in defendable positions and/or surround them with stockades.

Most of what is know about prehistoric peoples in the Ridge and Valley Province and adjacent regions is of Late Woodland peoples. For instance, of the 15 sites selected by Hatch et al. (1985) as examples of excavated sites in the Ridge and Valley Province, eleven are Late Woodland. This kind of bias toward later sites is common in the eastern United States and is a consequence of the accessibility of the sites themselves: They tend to be located in heavily plowed floodplain areas; they are close to the present soil/sediment surface; and they are productive in the number of artifacts produced. Thus, knowledge of the Late Woodland in the Susquehanna basin is, by comparison with previous traditions/periods, very good.

In Central Pennsylvania there are two main chronological subdivisions: Clemson Island and Shenk's Ferry. The first part of the Late Woodland, more clearly evident in the Upper than the Lower Susquehanna Valley, is associated with the Clemson Island culture. Clemson Island people continued the earlier Woodland practice of agriculture, hunting, fishing, and gathering wild plants. They also made grit-tempered pottery and broad-based, triangular projectile points. Their settlements consist of small villages with several

oval or sub-rectangular huts (Archaeological and Historical Consultants 1987:3-6). Some of the Clemson Island (and later Late Woodland) sites also contain semisubterranean features known as "keyhole" structures. Smith (1976) interpreted these features as sweathouses, but Hatch and Daugirda (1980) have argued for their utilization as smoking facilities. Jones (1931) excavated the Clemson Island type site near the Dauphin County village of Halifax in 1929. There he investigated a plow disturbed earthen mound, which originally might have been 40 ft in diameter and 8 ft high. Skeletal remains of 19 individuals were present, as were a small number of lithic artifacts and much pottery. The pottery frequently exhibited rows of deep punctuations just below the rim of the vessel.

The later Late Woodland period is dominated by the Shenks Ferry cultural complex. The main ceramic types associated with that complex are the Shenks Ferry Series, the Lancsater Incised Series, and the Funk Incised Series (Custer 1996:266-267). After A.D. 1300, the Shenks Ferry ceramic repertoire begins to add collars and triangular plat designs, probably under the influence of the Iroquoian styles (Custer 1996:270-272). Diagnostic lithic artifacts include Levanna and Madison triangular points/knives (Custer 1996:265). Three phases of the Shenks Ferry Complex have been defined for the Lower Susquehanna Valley – the Blue Rock, Lancaster, and Funk. A final Grubb Creek Phase also has been suggested. Some scholars (e.g., Stewart 1990) have suggested that Shenks Ferry emerges from early Late Woodland Clemson Island traditions of the Upper Susquehanna, while others (e.g., Graybill 1989) have suggested that it is more closely related to the Montgomery Focus of the Maryland Piedmont; the issue has not been resolved (Custer 1996:274-275).

The Shenks Ferry settlement pattern includes seasonal encampments of short duration, hamlets, and villages. During the Blue Rock Phase, seasonal camps and hamlets are the only sites identified. Seasonal camps occur in a variety of topographic settings and appear as lithic scatters in the archaeological record. Hamlets also appear in a variety of settings and include post molds, hearths, small sheet middens, and graves.

Wild plants and animals continued to comprise a significant portion of the subsistence effort during this phase, although some corn and bean domesticates also appear to have been utilized (Custer 1996:276-278). By the Lancaster and Funk phases, villages with a floodplain association have generally replaced hamlets as the dominant site type. The villages are stockaded and houses, storage/refuse pits, hearths, and graves are common. Examples of Shenks Ferry villages include the Frey Farm-Haverstick Site, the Kauffman II Site, the Murry Site, the Schultz-Funk Site, and the Slackwater Site (Custer 1996:278-285).

European Contact (A.D. 1500 – 1750)

The Contact Period can be divided into an early phase (A.D. 1500 – 1675), during which the Susquehannocks became the dominant socioeconomic force in eastern Pennsylvania, and a later phase (A.D. 1675 - 1750) during which the effects of epidemic diseases on Native American populations were profound and these populations were gradually forced to the west by European settlement expansion. The Susquehannock culture gradually replaced that of Shenks Ferry. The Susquehannocks were historically known Indians who began to build large stockaded villages near the major rivers of central Pennsylvania during the sixteenth century.

Characteristic artifacts of the Susquehannocks include shell-tempered pottery and small, narrow triangular projectile points (Archaeological and Historical Consultants 1987:3-6). These small upper Susquehanna River villages evidently were abandoned by 1575 as the Susquehannock moved south into Lancaster County and constructed large stockaded villages including the Schultz Site near Manor Township (Kent 1984:319-333). Their southward migration is theorized to be related to pressure from the Five Nations Iroquois and/or the better trade opportunities of the south (Jennings 1978). They controlled the fur trade throughout Pennsylvania during the early seventeenth century, and, through warfare with adjacent tribes, they became the dominant Indian population within the region between 1610 and 1660 (Becker 1985:45-47). The Susquehannocks also established hegemony over a vast area that included the Delaware and upper Potomac rivers. The Lenape of the Middle and Lower Delaware basin appear to have been their subjects. The Susquehannocks competed with the Seneca and other groups in New York for control over the lucrative fur trade with the Europeans, and Susquehannock sites show significant quantities of European trade goods. In 1675, these people were forced out of central Pennsylvania into the lower Potomac Valley. The Lenape do not appear to have been active in the fur trade, and fewer European goods are found at Contact Period Lenape sites (Custer 1996:305-315). Most Native Americans had left eastern Pennsylvania by 1750 (Custer 1996:316).

Historic Cultural Sequence Colonial Period (1681-1785)

In 1681, William Penn received a land grant from King Charles II for land west of the Delaware River, and established the proprietorship of Pennsylvania (Klein and Hoogenboom 1980:21). A devout Quaker, Penn administered the colony as a refuge from religious persecution, and intended the colony to be a land of ethnic and religious diversity. Between 1681 and the outbreak of the Revolutionary War, English, Germans, and Scots-Irish colonists sought a new life in Penn's colony, one that would be free from religious and political unrest (Klein and Hoogenboom 1980:45).

Penn's land policy was complicated by the presence of the Native Americans living within the boundaries of his original settlement. Penn initially had negotiated mutually acceptable land transactions with the indigenous populations to ensure peaceful relations. By 1683, the thousands of settlers who flocked to the colony forced Penn to purchase additional land from the colony's Native American tribes, including the Delawares, Shawnees, Susquehannocks, and other Iroquoian groups. However, Penn's generous and fairminded policies began to erode during the early eighteenth century as demands for additional land continued to escalate (Cuff et al. 1989:82). Eventually, Native American discontent with European trading practices and additional purchases of land led to conflict and mass emigration toward Ohio. European colonials known as the "Paxton Boys" murdered the remaining Susquehannocks

near Conestoga in 1763 (Jennings 1978:366). The present boundary of Lebanon County is located within William Penn's original land grant from King Charles II. Lebanon County is bordered by Schuylkill and Berks Counties to the northeast, Dauphin County to west, and Lancaster County to the south.

The fertile valleys east of the Susquehanna River along tributaries such as the Swatara Creek, attracted settlers beginning in the 1720s. A group of fifteen German Palatine families who had been living at Schoharie, New York, migrated to the Lebanon Valley in 1723. As Conrad Weiser later wrote, the group proceeded

. . .from schochary to the SusqueHana River. . .and descended the stream to the Mouth of Suartaro Creek. . . .From there they came to tulpehockin. . .others followed [and] took lands without permission of the authorities. . .and against the will of the Indians for the land had not yet been bought from Them, there was no one among the People to control them, everyone did as he liked. . . . (quoted in Wallace 1945:31).

The Tulpehocken settlement was located midway between the present cities of Lebanon and Reading; at the time of the German migration from New York, this region was virtually uninhabited. Wallace (1945:36) observes that, when Conrad Weiser arrived there in 1729, "from crest to crest of the Blue and South Mountains that flanked it the forest stretched unbroken except where some Delawares or Shawnees had made clearings for their corn, or where the Palatines were setting up their homesteads and extending their plantations." The first purchases of land on the Blue Mountain, which at that time was incorporated as part of Lancaster County, were made ca. 1736 (U.S. Army Corps of Engineers 1995:III-11).

The French and Indian War, which began in 1754, devastated the settlements along the Susquehanna and its tributaries. In 1755, a combined force of 1,500 French and Indians left Fort Duquesne (Pittsburgh) to raid the settlements to the east. By October, this force had reached the Susquehanna Valley, where they proceeded to raid and burn settlements at Penn's Creek (Selinsgrove), and then reportedly crossed the Susquehanna. By November, 1755, the French and their

Indian allies were raiding settlements and plantations along the Blue Mountains and along Swatara Creek (Wallace 1945:404-412).

Despite repeated petitions, the Assembly in Philadelphia lagged in sending assistance to the frontier settlements. As refugees streamed east in advance of the enemy, residents of the Lebanon Valley sought to organize their own defenses. Finally, at a January, 1756, conference at Carlisle, the Assembly agreed to establish three major forts along the Blue Mountain range at Lehigh Gap, at the Schuylkill River, and at Tolihaio on the Shamokin Trail (Wallace 1945:424). Smaller defenses also were established; a force of 50 was stationed at Manada Gap (Wallace 1945:425) and Brown's Fort was located near Indiantown Gap (U.S. Army Corps of Engineers 1995:III-13). Despite these defensive measures, however, Indian raids continued to take their toll in the Indiantown area, and home sites frequently were abandoned (Wallace 1945:489; U.S. Army Corps of Engineers 1995:III-12). The Blue Mountain frontier remained insecure until the conclusion of the war in 1763.

By 1776, approximately 300,000 European settlers inhabited the commonwealth (Klein and Hoogenboom 1980:45), principally between the Delaware and Susquehanna Rivers. By 1785, population in the area east of the Susquehanna had grown sufficiently to warrant the creation of Dauphin County by dividing off the northern sections of what had been Lancaster County; the area included that portion that now is incorporated in Fort Indiantown Gap. John Harris' Ferry was selected as the seat of the new county. The town, laid out in 200 quarter-acre lots by John Harris's son-in-law William Maclay, originally was named Louisbourg in honor of Louis XVI, but it was renamed Harrisburg in 1791.

Agrarian Expansion and Town Development (1785 – 1861)

Although the Revolutionary War slowed the process of Pennsylvania settlement, communities established before the war experienced steady development during the 1770s and 1780s (Cuff et al. 1989:83). By February 16, 1813, the regions east of Harrisburg had acquired sufficient population

to warrant the creation of Lebanon County by an Act of Assembly (U.S. Army Corps of Engineers 1995:III-11). The county seat, Lebanon, was laid out in 1750, chartered as a borough on February 20, 1821, and then as a city in 1885.

The regions east of Harrisburg, including the Lebanon Valley, remained primarily agrarian. Local crops consisted of wheat and corn (Hatch et al. 1985:107), and lumbering developed as a profitable enterprise on the wooded slopes of mountain ridges like the Blue Mountains. Home sites and agricultural complexes were located in valleys between the mountain ridges; grist and lumber mill sites were located close to streams to exploit the readily available water power (U.S. Army Corps of Engineers 1995:III-13).

In 1836, one industrial complex was established within the present boundaries of Fort Indiantown Gap. This was the Manada Furnace, which went into blast in 1836. A small company town, with tenant housing for furnace workers and their families, was established at the furnace. The principal reason for locating an iron-manufacturing complex in this location was the availability of large amounts of timber for charcoal, and small cabin and hut sites associated with charcoal burning dotted the mountain slopes. Iron ore was obtained from the Cornwall mines in southern Lebanon County, and limestone for flux could be acquired from quarries in the Valley approximately 10 miles south of Manada (U.S. Army Corps of Engineers 1995:III-14). The Manada Furnace continued to operate until 1875; in common with other charcoal-fired furnaces of the region like the one at Cornwall, it could no longer operate profitably in the era of modern hot-blast anthracite furnaces (Bitner 1990:23).

Civil War (1861 – 1865)

Pennsylvania played a crucial role in influencing both political and military events of the Civil War. This influence was due in large measure to the industrial development and innovation of the decade preceding the war. Ships, blankets, cannons, locomotives, rifles, and agricultural produce all helped to sustain the Union war effort. The state was considered "the Union's arsenal" (Stevens 1960:201). Almost 360,000 men served in the 248 battalions which formed the Pennsyl-

vania regiments, with more than 33,000 killed or mortally wounded in combat operations (Licht 2002:211).

In late June of 1863, believing that the Union army was south of the Potomac, General Robert E. Lee's Army of Northern Virginia entered Adams County. Lee's objectives included cutting the Pennsylvania Railroad to disrupt Union communications, scattering Union forces, threatening the state capital at Harrisburg, and replenishing much-needed supplies (Wiley 1897:40; Klein and Hoogenboom 1980:283). One objective of the Confederate raiding party led by General Richard Ewell was the capture of the Camelback Bridge which was built by Theodore Burr in 1817, and spanned the Susquehanna River by way of City Island. After a number of small skirmishes on the western shore of the river during 28 – 29 June the Rebel force withdrew without accomplishing their goal of seizing the state capital, and then marched south to join the fierce battle at Gettys-

Post-War Period (1865 – 1918)

From the Civil War to the turn of the twentieth century, Pennsylvania experienced its "Golden Age" as the leading industrial state of the nation. The economic and technological developments of the late nineteenth century transformed Pennsylvania. The period was characterized by the rapid displacement of agriculture in the region by major industries and the concomitant development of a transportation infrastructure. After the Civil War period, numerous communities had been established within the Lebanon Valley itself; the principal centers of population lay in the middle of the valley along the present day US Rt. 422 and the Reading Railroad. The smaller contiguous valleys of the Blue Mountain chain also contained a fully developed complement of churches, mills, schools, roadways, and home and farm sites. By 1875, communities within the immediate Fort Indiantown Gap region included Manada Furnace, Indiantown Gap, Ranktown, Bordnersville, and Keiserstown. Of particular interest were the settlements of Africa, a community of freedmen, and St. Joseph's Spring, a resort hotel complex located on the north slope of Blue Mountain (U.S. Army Corps of Engineers 1995:13-14). The use

of the mountain ridges adjacent to the Lebanon Valley for development of resorts was a relatively common late nineteenth century phenomenon; for example, the present resort community of Mount Gretna, located on South Mountain, was first established in 1884 (Bitner 1990:24-26).

Modern Period (1918 – Present).

For the Commonwealth of Pennsylvania, the period after World War I can be characterized as one of "enormous industrial development, extensive resource exploitation, and rapid urbanization." These three forces, which actually originated during the preceding period, intensified. This intensification brought about major social and economic changes. Chief among these was the dramatic increase in population. Around the turn of the century, road systems were improved and the automobile became a viable means of quick, affordable, and efficient transportation throughout the state. Electric trolley lines also linked the smaller communities of the Lebanon Valley like Annyille with major cities such as Lebanon and Harrisburg (Martha Rudnicki, personal communication, 1995). The completion of the Pennsylvania Turnpike in 1940 capped numerous decades of road system improvement; the turnpike was the first of its kind in the country (Hatch et al. 1985:105).

During the early twentieth century, however, farming began to decline in importance in the region. This agricultural decline related directly to the establishment of the installation known today as Fort Indiantown Gap, because it presented the potential for the purchase of large tracts of land at relatively inexpensive prices. The installation at Fort Indiantown Gap was established by the State of Pennsylvania in 1931 to replace an older, inadequate, Pennsylvania National Guard (PNG) facility at Mount Gretna (U.S. Army Corps of Engineers 1995:III-14-15).

The first PNG encampment in the Lebanon Valley region had been established at Mount Gretna as Camp Siegfried in 1885, on a tract of land encompassing 120 ac. (Bitner 1990:28-29), and the PNG presence there quickly escalated. The annual encampment at Gretna contributed materially to the development of the resort facilities there; troop parades and other activities were

major events for viewing by vacationers. However, by 1930, the Gretna facility lacked sufficient room to accommodate the requirements for operating modern weapons systems and the increased numbers of troops involved. The movement of the PNG training site to Indiantown Gap, coupled with the Great Depression, was responsible for the decline of Mount Gretna as a resort (Bitner 1990:155-156).

As initial construction of the facilities at Indiantown Gap began in 1932, the state government continued to expand the installation's boundaries. By 1934, the installation encompassed 10,000 ac. Activities at the installation included field artillery, cavalry, and infantry training. Through the 1930s, both the physical plant and the scope of training were enlarged. By 1939, the installation incorporated an aircraft landing field, a quartermaster's depot, several regimental camp sites, and numerous support buildings, most of which were constructed by the Civil Works Administration (CWA) and the Public Works Administration (PWA) programs of the federal government (U.S. Army Corps of Engineers 1995:III-16-18). Also worthy of note was the construction of the Appalachian Trail, a Civilian Conservation Corps (CCC) project; portions of the trail extended along the boundary of the installation on the southern slope of Blue Mountain.

In 1940, as World War II began in Europe and the possibility loomed that the United States could become involved in the conflict, the Indiantown Gap facility was leased by the State of Pennsylvania to the federal government. During the war, over 1,000 temporary buildings were constructed within the cantonment, and training areas were enlarged. At the end of the war, Fort Indiantown Gap served as a separation center until it was declared inactive in 1946 (U.S. Army Corps of Engineers 1995:22-24).

The outbreak of the Korean War in 1951 saw reactivation of the installation under federal authority, and in 1957 the facility became the head-quarters of the 21st Army Corps, with responsibility to supervise Army Reserve units. The camp again was pressed into federal service during the 1970s and 1980s, when it served as a resettlement center for almost 200,000 Cuban, Vietnamese and Cambodian refugees (U.S. Army Corps of Engi-

neers 1995:24-25). The Indiantown Gap National Cemetery was established through a land transfer of 677 acres (274 hectares) in 1976. The first in-

terment was in 1982 (A.D. Marble and MACTEC 2012).

CHAPTER III

RESEARCH DESIGN AND METHODS

Research Design and Objectives
The objectives of the Phase I survey investigation were: (1) to locate, identify, and delineate all prehistoric and historic cultural resources within the project area; (2) to make preliminary assessments of the potential significance of those resources, applying the National Register Criteria for Evaluation [36 CFR 60.4 (a-d)]; (3) to assess the impact of proposed development activities on the cultural resources situated within the project boundaries; and (4) to formulate management recommendations concerning those resources.

Archival Research Methods

Background research provided data on previously recorded resources in the project area and within a 0.5 mile (0.8 km) vicinity, and identified historic contexts and themes that provided guidance in assessing the potential significance of archaeological sites identified in or near the project area. PA-SHARE, the online inventory of architectural and archaeological sites and cultural resource surveys maintained by the Pennsylvania Bureau for Historic Preservation, provided information on previously recorded sites, structures, and surveys in the project area and the vicinity. Archival research focused on secondary-source county histories and historic maps. The results of the site file research are summarized at the beginning of Chapter II in the section, Previous Investigations.

Archaeological Field Methods

Approximately 8.5 acres (3.4 hectares) of the APE had been surveyed for archaeological resources previously and reviewed by the PA SHPO, and was not resurveyed. RCG&A completed a pedestrian reconnaissance of the remaining approximately 21.5 acres (8.7 hectares) of the APE. The reconnaissance complemented the background research by documenting slopes, disturbances, and any potential surface archaeological features. In undisturbed areas of 15 percent slope or less, systematic survey was undertaken. Since the study area was largely wooded and none of it was under active cultivation, the systematic survey consisted of shovel tests excavated at 15 meter (m) (49.2 foot [ft]) intervals.

In accordance with the PA SHPO guidelines, shovel tests measured a minimum of 57 cm (22.4 in) in diameter and were excavated to a minimum depth of 10 cm (3.9 in) into culturally sterile subsoil, except where soil conditions prevented full excavation. Soil were removed according to natural stratigraphic horizons and screened through 0.635 cm (0.25 in) hardware cloth. The location of each shovel test within the sampling pattern, the depths of the stratigraphic zones, and the presence or absence of cultural materials were recorded in the field. Soil characteristics, including color and texture, were recorded following standard soil nomenclature. Standard records and catalogues followed the revised Guidelines for Archaeological Investigations in Pennsylvania (PA SHPO 2017).

Prior to the archaeological survey, a geoarchaeological and geomorphological review of the proposed project area was conducted to assess the potential for cultural deposits buried beyond the depth of standard archaeological shovel testing. The review consisted of an initial map study to locate alluvial landforms in the project area. Data examined to locate alluvial landforms included topographic maps, Natural Resources Conservation Service (NRCS) soil series data, and the National Hydrology Dataset (NHD). The geoarchaeological and geomorphological review identified no alluvial land in the project area. The results of the review indicated it was unlikely that any deeply buried cultural deposits would exist beyond the depth of Phase I shovel testing for the proposed project area. Therefore, no deep testing was recommended or undertaken.

Records and Curation

No artifacts were identified or recovered. Upon completion of the project, all records, photographs, and field notes will be curated at the Pennsylvania State Museum.

CHAPTER IV

RESULTS OF ARCHAEOLOGICAL SURVEY INVESTIGATIONS

roject Specific Archival Investigation
Results
The proposed Phase 5 cemetery expansi

The proposed Phase 5 cemetery expansion includes two areas, measuring approximately 2.5 acres (1.0 hectare) and 27 acres (10.9 hectares), respectively. As noted above in Chapter II, two previously recorded archaeological sites, 36LE0516 and 36LE0517, are located within or immediately adjacent to the larger project area. Site 36LE516 consisted of a poured concrete foundation with deep fill composed of dark gray shale inside. Site 36LE517 consisted of a small lithic scatter at the edge of a steep slope. Both of these sites have been determined by the PA SHPO to not be eligible for the inclusion on the NRHP.

No structures are present in either area on the 1979 Indiantown Gap quadrangle map (cf. Figure 2). Other topographic maps, extending back to 1892, similarly depict no structures in either project area (NETRonline 2021). The 1875 Beers *County Atlas of Lebanon, Pennsylvania* shows one structure, noted as belonging to "DU. Gerberich," on the eastern edge of the larger project area (Figure 3). No evidence for this occupation was encountered during the survey.

Field Investigation Results

Survey Area 1

Survey Area 1 measured approximately 1.5 acres (0.61 hectares), and is situated south of Biddle Drive, and east of Committal Shelter 1 and the Honor Guard Building. An additional approximately 1.0 acre (0.40 hectares) of area proposed for the Phase 5 expansion was surveyed previously (A.D. Marble and MACTEC 2012) and was not resurveyed. The project area is partially wooded and partially grass covered.

A total of 15 shovel tests were excavated at 15 m (49.2 ft) intervals (Figure 4). Eight planned shovel tests were not excavated due to disturbances resulting from paved roads, gravel roads, road ditches, and slope inclines greater than 15 percent (Figure 5). The typical soil profile (ST N1030 E1030) consisted of 28 cm (11 in) of dark brown (10YR 3/3) silt loam underlain by at least 10 cm (3.9 in) of yellowish brown (10YR 5/4) silty clay loam. In some cases, the upper stratum was dark yellowish brown (10YR 4/4) or brown (10YR 4/3) and the lower one in one case was light olive brown (2.5Y 5/6). These strata variations all reflect the range of Ap and Bt horizons belonging to the Comly soil series mapped in the survey area (USDA NRCS 2021).

No archaeological artifacts were recovered and no archaeological sites were identified. Since no artifacts were recovered and no archaeological sites were identified within Survey Area 1, the proposed project will have no impact to archaeological historic properties, as defined in 36 CFR 800.16(1), in the studied area. No further archaeological investigation is warranted or recommended.

Survey Area 2

Survey Area 2 measured approximately 20 acres (8.09 hectares), and is situated north of Old Cumberland Street, west of Indiantown Road, and east of the existing cemetery drive. An additional approximately 7 acres (2.83 hectares) of area proposed for the Phase 5 expansion was surveyed previously (A.D. Marble and MACTEC 2012) and was not resurveyed. The project area included deciduous forest, an area of previous landscape modification (approximately 2.8 acres), and actively disturbed zones (approximately 0.5 acres).

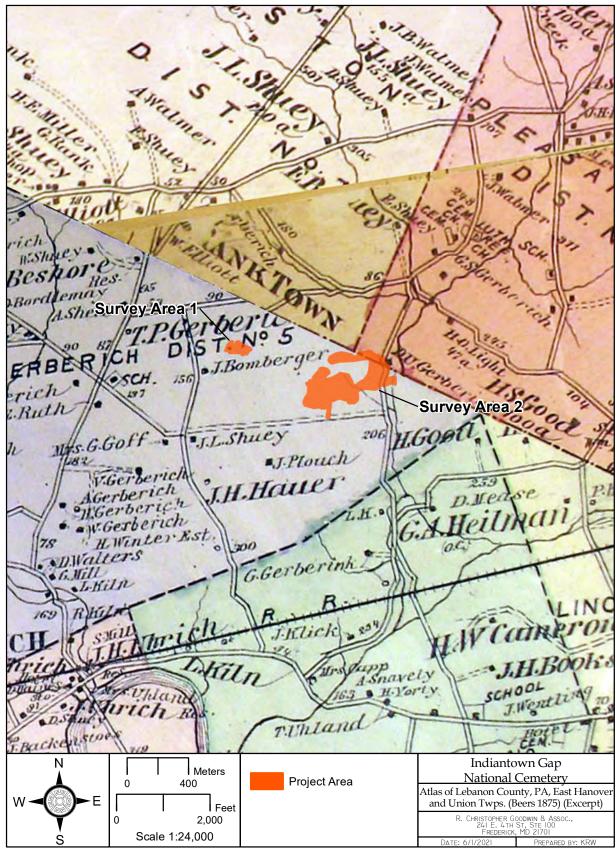


Figure 3. Excerpts from Beers' 1875 County Atlas of Lebanon, Pennsylvania, East Hanover and Union Townships, showing the project area



Figure 4. Aerial photograph, showing Survey Area 1 archaeological testing



Figure 5. Photograph of Survey Area 1, looking west

A total of 209 shovel tests were excavated at 15 m (49.2 ft) intervals (Figure 6). A total of 135 planned shovel tests were not excavated due to disturbances resulting from artificial landform development, gravel roads, active construction, and to wet areas and slope inclines greater than 15 percent (Figures 7 - 9). Area 2 is mapped as containing three different soil series. Weikert channery silt loams make up the majority of the surveyable area, followed by Berks channery silt loam, and Bedington shaly silt loam. The typical soil profile (ST E1120 E1210) for the Weikert soil series consisted of 28 cm (11 in) of brown (10YR 4/3) silt loam underlain by at least 10 cm (3.9 in) of yellowish brown (10Y 5/6) silty clay loam. Both soil horizons include varying percentages of channery with Ap and Bw horizons containing 5-10 percent channery. The typical soil profile (ST E1330 N1045) for the Berks soil series consisted of 25 cm (9.8 in) of brown (10YR 4/3) silty loam underlain by at least 10 cm (3.9 in) of yellowish brown (10YR 5/6) silty clay loam. While the soil consistency of the typical shovel test and its neighbors was silty clay loam, both the Ap and Bw1 horizons contain 10 percent rock inclusions, aligning well within the Berks soil series channery texture. Finally, the typical soil profile (ST E1405 N1135) for the Bedington soil series consisted of 30 cm (11.8 in) of dark brown (10YR 3/2) silt loam underlain by at least 10 cm (3.9 in) of yellowish brown (10YR 5/6) silt loam. Both the Ap and Bt1 horizons contain 15 percent rock, aligning well within the soil series descriptions for Bedington shaly silt loam. These strata reflect the range of soil horizons belonging to their respective soil series mapped in multiple portions of the survey area (USDA NRCS 2021).

A concrete block foundation was identified near ST N955 E1135 (cf. Figure 6). This foundation measured 1.38 x 3.20 m (4.53 x 10.50 ft) and was 1.05 m (3.44 ft) deep inside (Figure 10). No artifacts were identified inside nor around the foundation, either on the surface or in the nearby shovel test. With the absence of artifacts, the date of this foundation is uncertain, but the appearance of the blocks was modern, and the remains were not defined as an archaeological site.

No archaeological artifacts were recovered and no archaeological sites were identified. Since no artifacts were recovered and no archaeological sites were identified within Survey Area 2, the proposed project will have no impact to archaeo-



Figure 6. Aerial photograph, showing Survey Area 2 archaeological testing



Figure 7. Photograph of Survey Area 2, looking north through disturbed area



Figure 8. Photograph of Survey Area 2, looking south from the southeastern section of project



Figure 9. Photograph of Survey Area 2, looking south



Figure 10. Photograph of Survey Area 2, looking west at concrete block foundation

logical historic properties, as defined in 36 CFR 800.16(1), in the studied area. No further archaeological investigation is warranted or recommended.

Statewide Pre-Contact Probability Model Comparison

The Pre-Contact Model generally classified the project area has having a moderate to high potential for Pre-Contact sites, with 61 per cent having moderate potential, 20.7 per cent high potential, and 18.3 per cent no coding or presumed low potential (Table 2). The survey did not confirm the prediction of moderate to high archaeological potential as no Pre-Contact artifacts were recovered. No evidence of the historic oc-cupation along the eastern edge of Survey Area 2 was identified either.

Table 2. Statewide Pre-Contact Probability Model comparison

Sensitivity Tier	Area within this Tier	Percent of Total Project Area	Method(s) Used to test this tier	Number of Sites Located
High	18,009 sq. m.	20.7 per cent	STPs (15 m) – 72.4%; Pedestrian – 27.6% (more	0
			sloped or disturbed than expected)	
Moderate	53,054 sq. m.	61 per cent	STPs (15 m) – 60.9%; Pedestrian – 39.1% (more	0
			sloped or disturbed than expected)	
No Coding (Low)	15,945 sq. m.	18.3 per cent	STPs (15 m) – 43.7%; Pedestrian – 56.3%	0

CHAPTER V

SUMMARY AND RECOMMENDATIONS

This report has presented the results of the Phase I archaeological survey for the proposed Phase 5 Expansion at the Indiantown Gap National Cemetery, Annville, East Hanover Township, Lebanon County, Pennsylvania. The project is located on federal property. As a federal undertaking, it will be reviewed under Section 106 of the National Historic Preservation Act of 1966. All work was completed following standards promulgated in *Archaeology and Historic Preservation: The Secretary of the Interior's Standards and Guidelines*, and in the revised *Guidelines for Archaeological Investigations in Pennsylvania* (PA SHPO 2017).

The Phase I survey was undertaken by RCG&A on behalf of Mabbett & Associates, Inc. from April 20 - 23, 2021. Approximately 8.5 acres (3.4 hectares) of the APE has been surveyed for archaeological resources previously

and reviewed by the PA SHPO, and were not resurveyed. RCG&A completed a pedestrian reconnaissance of the remaining approximately 21.5 acres (8.7 hectares) of the APE. In undisturbed areas of 15 percent slope or less, systematic survey was undertaken using shovel tests excavated at 15 m (49.2 ft) intervals. Geomorphological review had indicated that no deep testing was needed. A total of 224 shovel tests were excavated. No archaeological artifacts were recovered and no archaeological sites were identified.

Recommendations

Since no artifacts were recovered and no archaeological sites were identified within the proposed project area, the proposed project will have no impact to archaeological historic properties, as defined in 36 CFR 800.16(1), in the studied areas. No further archaeological investigation is warranted or recommended.

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Michael B. Hornum, Ph.D., served as Principal Investigator and Project Manager, and supervised all aspects of the study. Field investigations were directed by Thomas Wambach, M.A., and also included the participation of Kevin Clark, B.A., Dan Grose, B.A., and Hanah Romsburg, B.A. Kristopher R. West, M.A. was the project geomorphological consultant. Archival investigations were undertaken by Katherine Grandine, M.A. The report graphics were done by Kristopher R. West, M.A. The report was produced by Ms. Sharon Little.

APPENDIX I RESUMES OF KEY PROJECT PERSONNEL

Dr. Michael Hornum earned a Ph.D. in Classical and Near Eastern Archaeology from Bryn Mawr College. Dr. Hornum has served as field supervisor or project manager on dozens of projects for a variety of private, county, state, and federal clients. He has directed or managed projects in Florida, Indiana, Kentucky, Maryland, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. His experience cuts across all phases of archeological investigation, including surveys, evaluations, data recoveries, and archaeological damage assessments. Since joining R. Christopher Goodwin & Associates, Inc. in 1993, Dr. Hornum's projects have included investigations at prehistoric and historic sites, ranging from the late Paleo-Indian through the Late Woodland periods, and from the late seventeenth through the early nineteenth centuries.

Dr. Hornum has extensive experience in ensuring Sections 106 and 110 compliance on Federal installations. His projects have included large Phase I surveys at Aberdeen Proving Ground, Fort George G. Meade, Naval Surface Warfare Center Carderock, Naval Air Station (NAS) Oceana, Naval Security Group Activity (NSGA) Northwest, Naval Radio Transmitter Facility (NRTF) Driver, and Naval Weapons Station (NWS) Yorktown. Dr. Hornum also has managed archaeological evaluations at Aberdeen Proving Ground, NSGA Northwest, the USDA's Beltsville Agricultural Research Center (BARC), and Naval Air Station (NAS) Patuxent River. Dr. Hornum has guided data recovery excavations at Aberdeen Proving Ground, NSGA Northwest, BARC, and NAS Patuxent River. He also has designed interpretative exhibits for Navy installations in Virginia, West Virginia, and Puerto Rico. These exhibits have included panels, artifact display cases, and in one case, an interactive computer kiosk. Dr. Hornum also has worked with Aberdeen Proving Ground, NAS Oceana, NWS Yorktown, and NSGA Northwest to create Integrated Cultural Resources Management Plans (ICRMPs) for managing archaeological resources at these installations.

Dr. Hornum has considerable experience in establishing archaeological compliance for major pipeline projects. During the FGT Phase III expansion project, Dr. Hornum directed three archaeological evaluations of prehistoric sites, and served as project manager for the data recovery at Site 8LE2105. Dr. Hornum managed the Pennsylvania portion of the Independence Pipeline project, which included survey and archaeological evaluations of six sites. Dr. Hornum also served as project manager for over 50 miles of pipeline replacement (Line 1278) in eastern Pennsylvania, including survey, archaeological evaluations of thirteen sites, and data recovery at three sites. Dr. Hornum managed Phase I through III investigations for both the Eastern Market Expansion Project in Ohio, West Virginia, and Virginia, and the Rockies Express East Project in Ohio and Indiana. Dr. Hornum managed the data recovery investigations at Site 46MR139 in Marshall County, West Virginia for the Appalachian Gateway Project. Dr. Hornum managed the archaeological investigations for the TEMAX, TEAM 2012, and TEAM 2014 projects across southern Pennsylvania, the East Side Expansion Project in eastern Pennsylvania and New Jersey, the Line MB Extension Project in Maryland, the Leach XPress Project in Kentucky, Ohio, Pennsylvania, and West Virginia, and West Virginia.

Dr. Hornum also has worked with other private clients, and with state and local agencies to bring their projects into compliance. Among his Maryland projects were archaeological data recovery at Site 18HO284 in Howard County, nine evaluations at Chapman's Landing in Charles County, and archaeological survey at the proposed Tanyard Cove, Beech Tree, and Willow Grove developments in Anne Arundel and Prince George's counties. His Virginia and West Virginia projects include archaeological surveys at several properties for Virginia Natural Gas, Inc., Eastern Associated Coal Corporation, and Norfolk and Southern Railroad. In Pennsylvania, Dr. Hornum directed archaeological survey for Pennsylvania DOT's proposed Kittanning Bypass, and was instrumental in creating an Archaeological Protection Plan for the City of Pittsburgh.



U.S. Department of Veterans Affairs Indiantown Gap National Cemetery Phase 5 Expansion Project

Aquatic Resource Delineation Report



Prepared by:

Thompson Environmental Surveys & Permitting, LLC.

July 2021

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1 Introduction

Thompson Environmental Surveys & Permitting, LLC. (TES&P) has prepared this Aquatic Resource Delineation Report to document studies conducted for Mabbett & Associates, Inc. (Mabbett) at the Indiantown Gap National Cemetery Phase 5 Expansion Project (Project). The studies were preformed to identify existing conditions within the Project area for future project planning, design, and permitting purposes. The delineation results will allow future project teams to modify project plans and avoid/minimize potential impacts to regulated resources. The Project area consists of an approximately 250-acre site located at Fort Indiantown Gap, south of Biddle Drive and west of Indiantown Road in Union and East Hanover Townships, Lebanon County, Pennsylvania (**Figure 1 - Project Location Map**). The Study Area boundaries are depicted on Figures 1, 2, and 3. The coordinates for the approximate Project center are 40.42360° and -76.55986°. This report documents the methodology and results of the aquatic resource investigations performed by TES&P for the Project.

2 Background

The Project is located within the United States Geological Survey (USGS) Indiantown Gap, PA 7.5-minute series topographical quadrangle (USGS, 2013). Land cover within the Project area consists of mowed maintained open areas, forest, wetlands, watercourses; and floodplain/riparian areas. Land uses in the vicinity of the Project consisted of developed military training ranges and facilities, maintained cemetery grounds, transmission line right-of-way, and primary and secondary roadways. The Project area drains north and east to Aires Run and south to mindianyown Run both of which are located in Swatara Creek Watershed and the Lower Susquehanna River basin.

Both Aires Run and Indiantown Run have a PA Code, Title 25, Chapter 93 designated protected aquatic life uses of Warm Water Fishes, Migratory Fishes (WWF, MF) (Commonwealth of PA, 2018a). The Pennsylvania Department of Environmental Protection (PADEP) does not list Aires Run, Indiantown Run or any of their tributaries located within the vicinity of the Project as having an Existing Use Classification (PADEP, 2019).

The Pennsylvania Fish and Boat Commission (PFBC) does not list Aires Run or Indiantown Run as Stocked Trout Waters (PFBC, 2018a and 2018b), or as Wild Trout Waters (PFBC, 2018c). However, wetlands which serve as habitat for fauna or flora listed as "threatened" or "endangered" under the Endangered Species Act of 1973, or wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified as habitat for flora or fauna listed as "threatened" or "endangered" are considered Exceptional Value.

According to the 2016 Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report, no watercourses within the vicinity of the Project are listed as siltation impaired waterbodies (PADEP, 2016).

Three (3) wetlands identified by the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) are located within proximity to the Project Study Area. These wetlands are classified as riverine, unknown perennial, unconsolidated bottom, permanently flooded (R5UBH) and riverine, intermittent, unconsolidated bottom, permanently flooded (R4SBC) (**Figure 2 – Soil and NWI Map).**

Study Area Soils were investigated and one soil unit within the Study Area was determined to be hydric, three soil units were determined to have hydric inclusions. Table 1 contains a comprehensive list of soil map units located within the Study Area and lists their hydric ratings (NRCS, 2018). Soil map units are depicted in Figure 2.

Table 1	
Study Area Soils	3

Soil Map Unit	Description	Hydric Rating
BeB	Bedington shaly silt loam, 3 to 8 percent slopes	No
BeD	Bedington shaly silt loam, 15 to 25 percent slopes	No
BkB	Berks channery silt loam, 3 to 8 percent slopes	Inclusions of Brinkerton
BkD	Berks channery silt loam, 15 to 25 percent slopes	Inclusions of Brinkerton
CmB	Comly silt loam, 3 to 8 percent slopes	Inclusions of Brinkerton
Но	Holly silt loam	Yes
WeB	Weikert channery silt loam, 3 to 8 percent slopes	Inclusions of Brinkerton
WeD	Weikert channery silt loam, 15 to 25 percent slopes	No

3 Methodology

TES&P identified and delineated wetlands and watercourses within the Study Areas on October 07, 08, 2020, April 28, 2021, and June 10, 2021. The resources identified by TES&P are potentially regulated under the Clean Water Act of 1972 as *Waters of the United States* and under PA Code, Title 25, Chapter 105 as *Regulated Waters of this Commonwealth* (Clean Water Act of 1972; Commonwealth of PA, 2009b,). During field investigations all wetlands and watercourses located within the Study Area were identified and delineated. The location of each identified resource was recorded using a high-precision, handheld GPS receiver.

Prior to initiating the field delineation efforts, TES&P conducted a detailed desktop review of the Project area. The existing sources used for the desktop investigation included: United States Geological Survey (USGS), PA 7.5-minute series topographical quadrangle, (USGS, 2013); the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS, 2018) Soil Survey Geographic (SSURGO) Database for Lebanon County, Pennsylvania, the United States Fish and Wildlife Service (USFWS, 2018) National Wetland Inventory (NWI) polygon for Pennsylvania, and aerial imagery.

During field investigations wetlands were identified and delineated using the Modified Routine Wetland Delineation Method described in the United States Army Corps of Engineers' (USACE) Wetland Delineation Manual, Technical Report Y-87-1, using criteria described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (Environmental Laboratory, 1987a; USACE 2012). During field investigations, data was collected for each delineated wetland and an adjacent upland sample point including dominant vegetation, soil characteristics, hydrology, and other information necessary to complete USACE (2012) Wetland Determination Data Forms.

Wetlands within the Study Area were classified according to the USFWS Classification of Wetlands and Deepwater Habitats for the United States. Wetland classifications were based upon vegetation type and dominance: palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), and palustrine unconsolidated bottom (PUB). Dominant vegetation was evaluated on percent aerial cover for each stratum: tree, sapling/shrub, herbaceous, and woody vine (Cowardin et al., 1979).

Each plant species was assigned an indicator status based on the National Wetland Plant List (Lichvar et al., 2016). The following indicator statuses were assigned: obligate (OBL), facultative wet (FACW), facultative (FAC), facultative upland (FACU), upland (UPL), no status (NS), or not indicated (NI). The Munsell Soil-Color Chart (Munsell, 2009) was utilized to assess soils.

Once TES&P biologists determined that an area met the criteria to be considered a wetland, data and photos were collected, and the resource boundary was surveyed. A high-precision, handheld, global positioning system (GPS) receiver (model GeoXH handheld, Trimble, Sunnyvale, CA) was used to record the boundaries of each wetland.

To identify and delineate watercourses, TES&P performed an on-site evaluation based on typical watercourse characteristics such as defined streambed and streambanks, exclusion of terrestrial vegetation, hydrologically-sorted substrate material, and the presence of an ordinary high-water mark (OHWM). If a watercourse was delineated, information was collected for each resource including but not limited to approximate top of bank width, approximate channel depth, flow depth, channel substrate, and channel morphology. The extent of each watercourse was recorded with a GPS unit. For watercourses exhibiting an average width at the OHWM of ten feet or greater, both left and right banks were recorded. For watercourses with average width at the OHWM of less than ten feet, the centerline of the channel was recorded.

4 Results

Fourteen (14) wetlands, nineteen (19) watercourses and one (1) constructed storm basin were identified and delineated within the Study Area. Locations of the identified resources are depicted on **Figure 3**. Data forms for the individual wetlands are included in Appendix B. Photographs of the resources are included in Appendix C. Descriptions of the identified wetlands and watercourses are summarized below.

Wetlands

A total of (16) wetlands were located and delineated within the Study Area. All of the fourteen wetlands, were classified as PEM. The total area of wetlands identified within the study area was 1.09 acres. The landform/geomorphic settings of these wetlands included floodplains, hillside seep/springs and closed topographic depressions/isolated systems. According to PA Code, Title 25, Chapter 105.17 (1, paragraph i), Wetlands which serve as habitat for fauna or flora listed as "threatened" or "endangered", or wetlands that are hydrologically connected to or located within 1/2-mile of habitat for fauna or flora listed as "threatened" or "endangered" are considered EV under the Endangered Species Act of 1973. An initial Phase 1 Bog Turtle Habitat Survey was completed by TES&P concurrently with the Aquatic Resources Survey one wetland INC-W-002 was identified as potential bog turtle habitat. F second Phase 1 survey was conducted in June of 2021 and four assitional wetlands were identified as potential bog turtle habiat. Phase 1 Bog Turtle Habitat Survey Report and Phase 1 Bog Turtle Addendum were completed by TES&P and submitted to the United States Fish and Wildlife Service (USFWS) under separate cover. The results of these reports are currently under review by the USFWS, pending the results of the USFWS review all wetlands identified within the Study Area are considered EV until a Phase 2 Bog Turtle Presence/Probable Absence Survey has determined the probable absence of bog turtles in wetlands identified as potential bog turtle habitat. Refer to Table 2 for classifications and sizes of the field-identified wetlands. Detailed wetland information is provided on the wetland data forms in Appendix B. Photographs of each wetland can be found in Appendix C.

Table 2
Field Identified Wetlands

Wetland ID	Classification	Delineated Size (ac)	Total Delineated Size (ac)
INC-W-001* **	PEM	0.14	0.14
INC-W-002* **	PEM	0.37	0.37
INC-W-003**	PEM	0.01	0.01
INC-W-004**	PEM	0.02	0.02

Wetland ID	Classification		Delineated Size (ac)	Total Delineated Size (ac)
INC-W-005**	PEM		0.01	0.01
INC-W-006**	F	PEM	0.04	0.04
INC-W-007* **	F	PEM	0.10	0.10
INC-W-008* **	F	PEM	0.08	0.08
INC-W-009* **	F	PEM	0.04	0.04
INC-W-010**	F	PEM	0.01	0.01
INC-W-011**	PEM		0.02	0.02
INC-W-012**	PEM		0.20	0.20
INC-W-013**	PEM		0.01	0.01
INC-W-015**	PEM		0.04	0.04
INC-W-019**	PEM		0.02	0.02
INC-W-020**	PEM		0.01	0.01
Total Wetlands:		14	Total Area PEM:	1.12
* Wetlands extend outside the Study Area. ** Exceptional Value Wetland PEM – Palustrine Emergent PFO – Palustrine Forested PSS – Palustrine Scrub-Shrub			Total Area PSS	0.00
			Total Area PFO	0.00
			Total Area PUB	0.00
			Total Wetland Area	1.12

Wetlands in the Project Area were typical of systems located in areas with historically disturbed land use including residential/developed areas, agriculture, or forested lowlands. The areas with steep slopes or low-lying topography and saturated soil conditions are generally unsuitable for development so these areas frequently remained as forested or wooded lots. In the areas that have been developed the natural hydrology has commonly been manipulated to maximize suitable areas for building. Subsequently, the Study Area contains multiple maninduced and disturbed areas that have been identified as wetlands. The areas that have not been utilized or developed typically are bordered by wooded gullies containing perennial or intermittent watercourses and wetlands. A combination of these characteristics was evident throughout the Study Area. Typical wetland vegetation, soil characteristics, and hydrology identified within the identified wetlands are discussed below.

Vegetation

Wetlands in the project area displayed a combination of the vegetative species common to the region. The most common herbaceous plant species observed were Japanese stilt grass (*Microstegium vimineum*), jewelweed (*Impatiens capensis*), cattail (*Typha Latifolia*), and arrowleaved tearthumb (*Persicaria sagittata*). The most common shrub species observed were spicebush (*Lindera benzoin*) and multiflora rose (*Rosa multiflora*). The most common tree species observed were green ash (*Fraxinus pennsylvanica*), and red maple (*Acer rubrum*).

Soils

Wetland soils varied by wetland, but some generalizations can be made. The most common matrix hues were 10YR or 7.5YR with low chroma (≤ 2) and values between 4 and 6 with redox concentrations. Depleted Matrix (F3) was the most common hydric soil indicator observed. The most common soil texture was silt loam underlain

by a clay loam layer. Upland soils typically displayed hues of 10YR or 7.5YR with values between 4 and 6 with chroma ranging from 3 to 4.

Hydrology

The most common primary indicators of hydrology observed within the Project Area wetlands were Surface Water (A1), High Water Table (A2), and Saturation (A3). However, the region has experience very dry conditions over the last three months and observed indicators of hydrology were difficult to determine in many circumstances. The most common secondary indicators observed were Saturation Visible on Aerial Imagery (C9), and Drainage Patterns (B10). The primary sources of hydrology differed between wetland types. Seasonal high groundwater, groundwater discharge, and surface water runoff collection were the primary sources of hydrology observed.

Watercourses

TES&P identified and delineated ten (10) ephemeral (EPH) watercourses, seven (7) intermittent (INT) watercourses, and two (2) perennial (PER) watercourses within the Study Area (**Figure 3**). A summary of the delineated watercourses is provided in Table 3. Photographs of each watercourse can be found in Appendix C.

Table 3 Field Identified Watercourses

Resource ID	Classification	Total Delineated Size (If)
INC-S-001	PER	1279.51
INC-S-002	INT	1214.26
INC-S-003	EPH	426.90
INC-S-004	EPH	56.51
INC-S-005	INT	165.43
INC-S-006	INT	53.26
INC-S-007	EPH	25.73
INC-S-008	INT	588.83
INC-S-009	EPH	133.43
INC-S-010	EPH	589.44
INC-S-011	EPH	311.85
INC-S-012	PER	2485.74
INC-S-013	INT	80.13
INC-S-014	EPH	343.15
INC-S-015	INT	285.04
INC-S-016	EPH	485.85
INC-S-017	INT	189.98
INC-S-018	EPH	164.31
INC-S-019	EPH	136.00
Totals:	19	8877.35

Watercourses within the Study Area ranged from small EPH surface water drainage courses, INT watercourses that convey seasonal ground water hydrology, and PER watercourses that contain persistent surface water flow. Generally a watercourse that only conveys surface water from precipitation events was considered EPH, watercourses that originate in wetlands or at the discharge of seasonal groundwater seeps were classified as INT and watercourses that contained a persistent surface flow associated with connection to the ground water table were classified as PER. PER watercourses also typically contained species of aquatic organisms including finfish and macroinvertebrate species that require persistent surface water for survival.

6 **Summary**

TES&P conducted aquatic resource delineations on October 2020, April 2021, and June 2021 within the approximately 250-acre Study Area for the Indiantown Gap national Cemetery Expansion Project. This field effort resulted in the delineation of sixteen (16) wetlands and nineteen (19) watercourses.

This report was prepared by:

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Senior Biologist/Owner

7 References

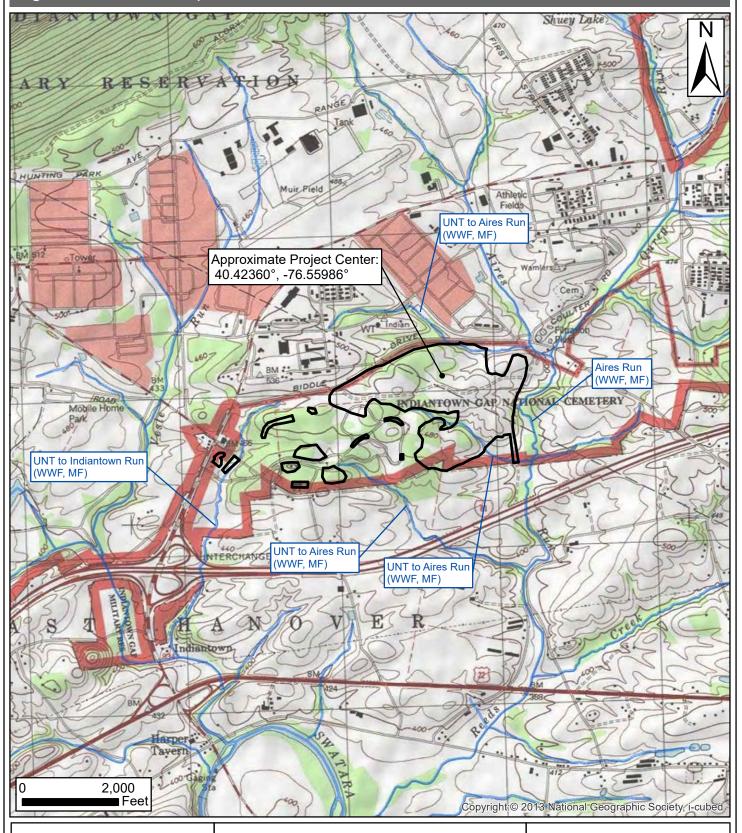
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Appendix A Figures

INDIANTOWN GAP NATIONAL CEMETERY

Figure 1: Location Map



THOMPSON ENVIRONMENTAL
Surveys & Permitting, LLC.

Date: 7/19/2021 | Created By: CMG

USGS 7.5' Quadrangle: Indiantown Gap
East Hanover and Union Townships
Lebanon County, Pennsylvania

Mabbett[®]

R4SBC

Data Source:
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Lebanon County, Pennsylvania. Available online. Accessed September 15, 2018.

U.S. Census Bureau. TIGER Products website. September 15, 2018 U.S. Department of Commerce, Census Bureau, Washington, D.C. https://www.census.gov/geo/maps-data/data/tiger.html

U.S. Fish and Wildlife Service. May 1, 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/

Mabbett*

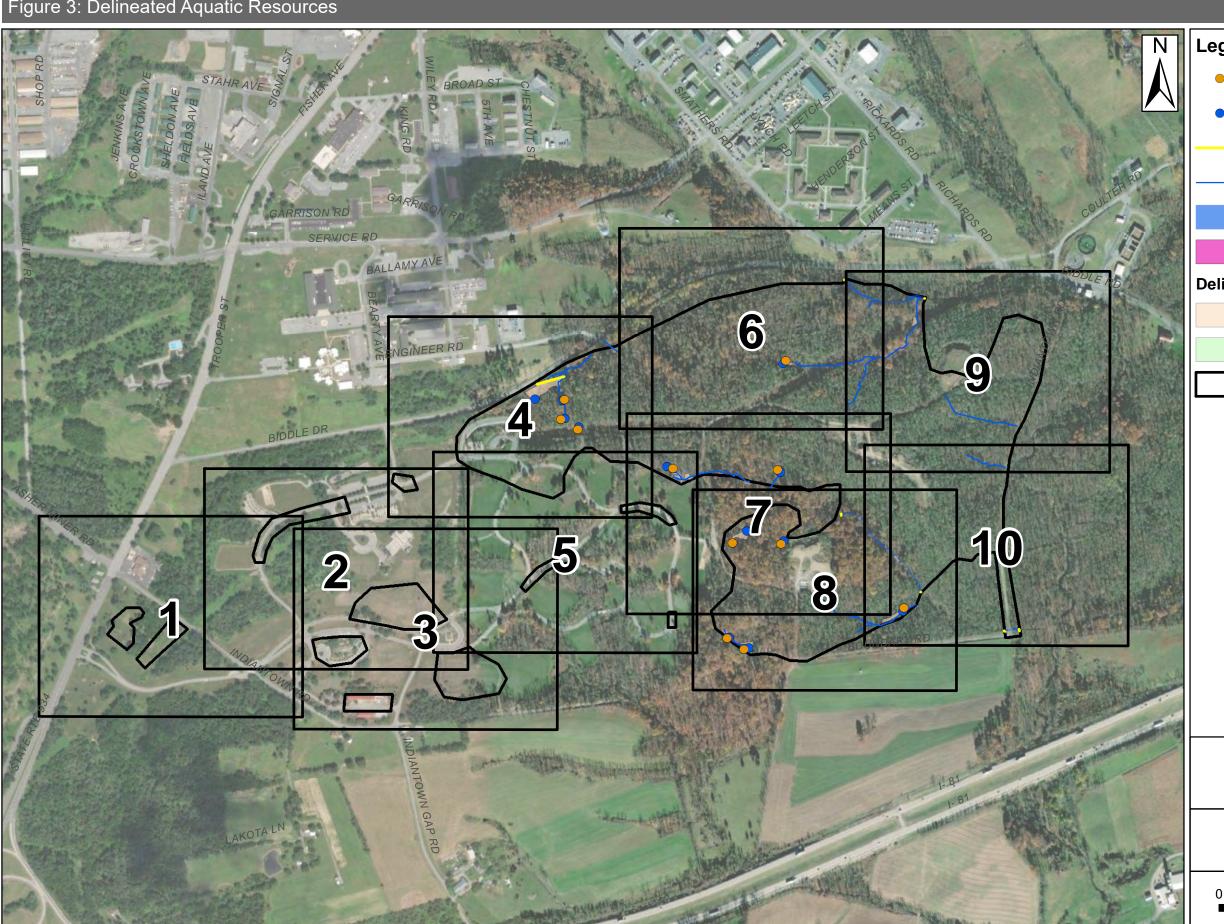


0 300 600 Feet

R4SBC R2UBH

Created By: CMG

Date: 7/19/2021



Legend

- **Upland Sample Point**
- Wetland Sample Point
- Open End
- **Delineated Watercourse**
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

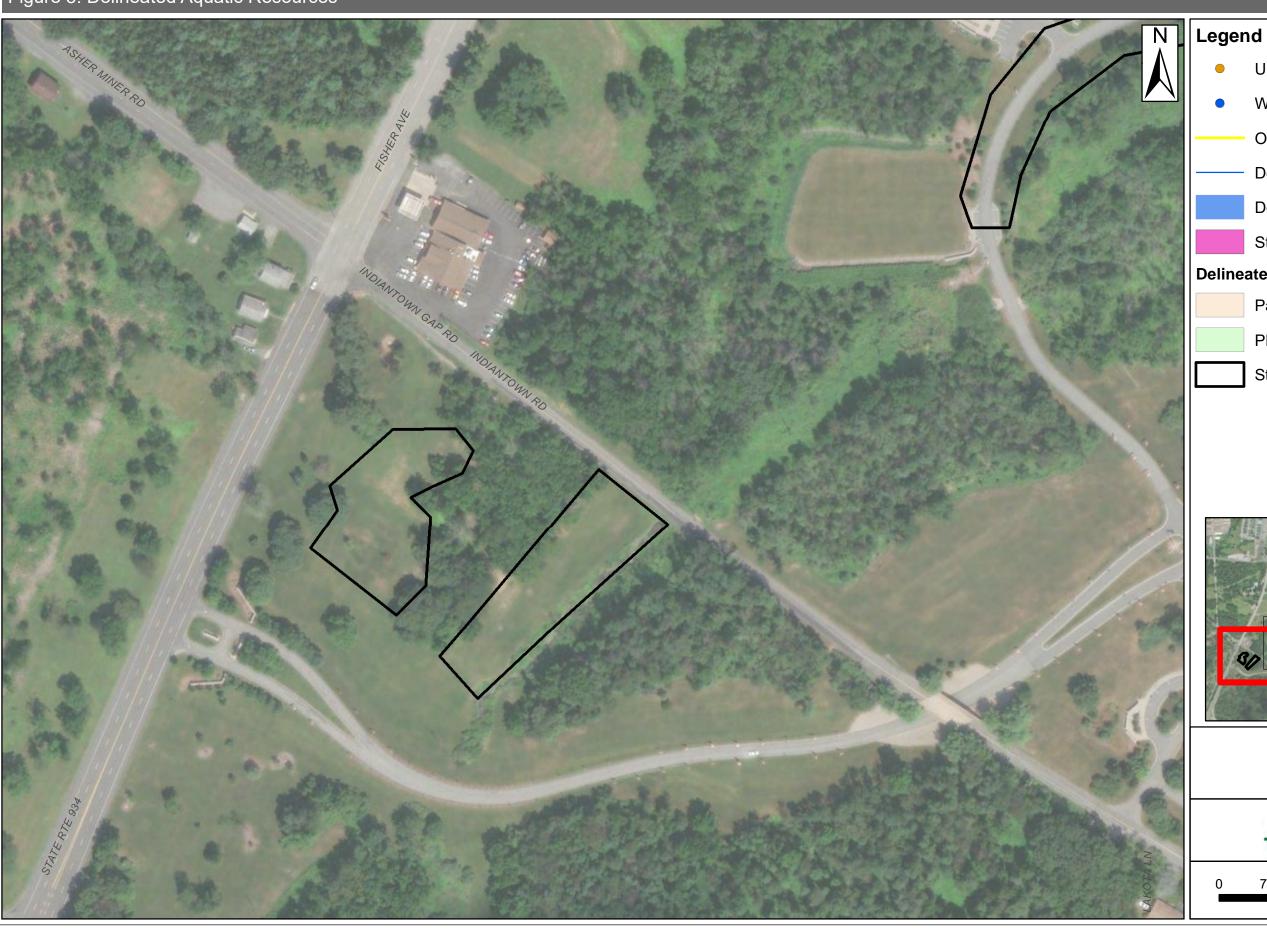
- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area

Mabbett[®]



670 ☐Feet

Created By: CMG



- **Upland Sample Point**
- Wetland Sample Point
 - Open End
- **Delineated Watercourse**
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area

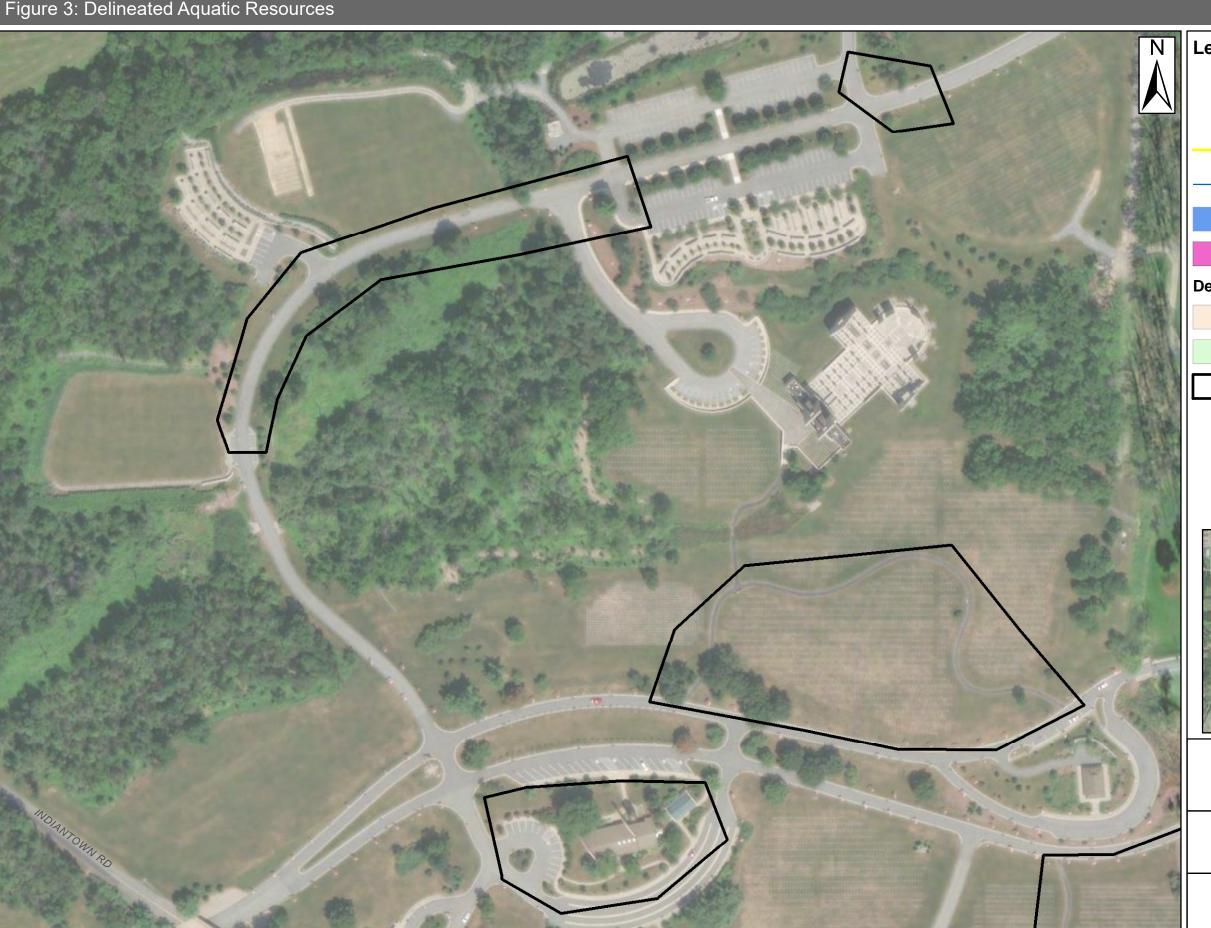


Mabbett[®]



150 Feet

Created By: CMG



Legend

- **Upland Sample Point**
- Wetland Sample Point
 - Open End
 - **Delineated Watercourse**
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area



Mabbett[®]



150 Feet

Created By: CMG



Legend

- **Upland Sample Point**
- Wetland Sample Point
- Open End
 - **Delineated Watercourse**
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area

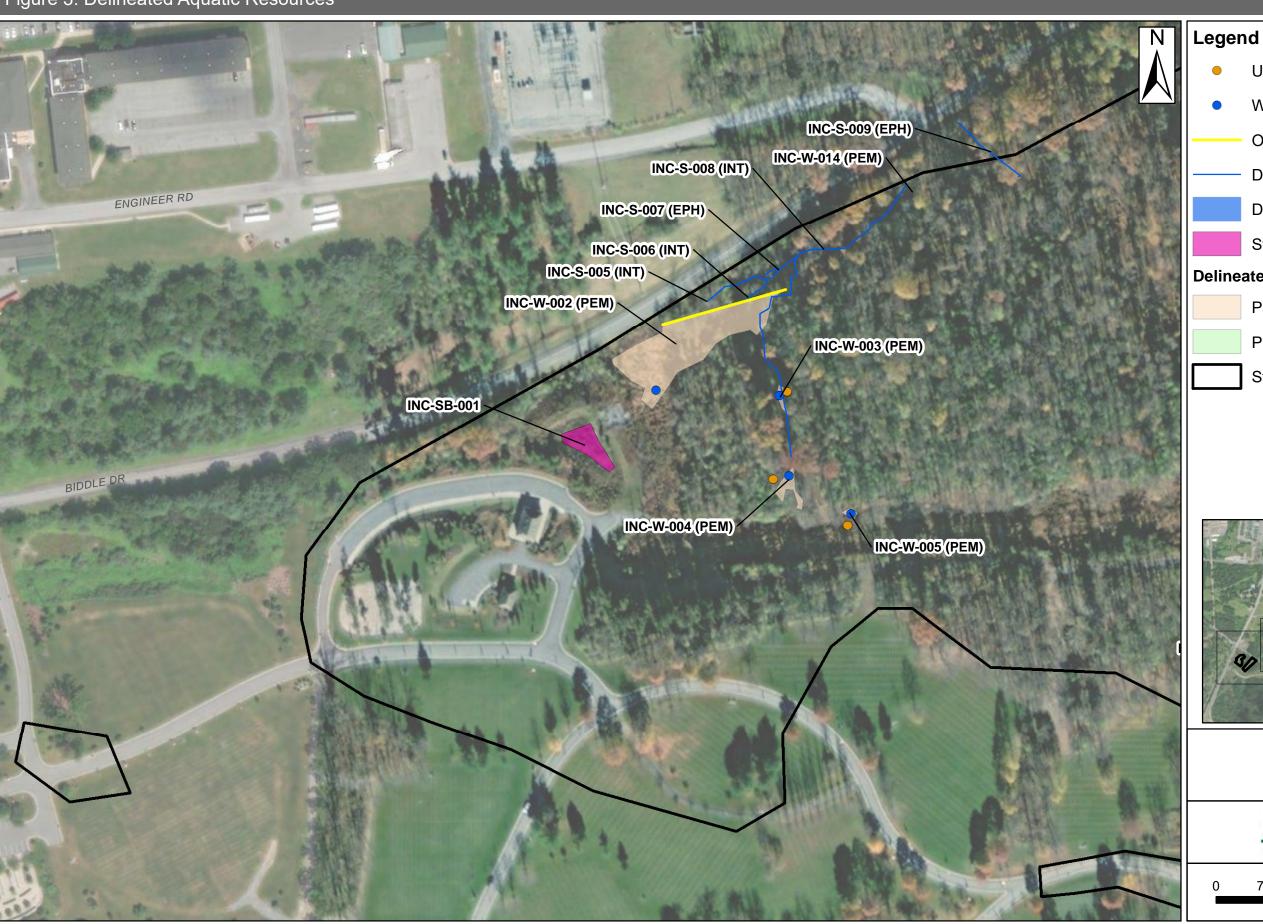


Mabbett[®]



150 ____ Feet

Created By: CMG



- **Upland Sample Point**
- Wetland Sample Point
- Open End
 - **Delineated Watercourse**
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area

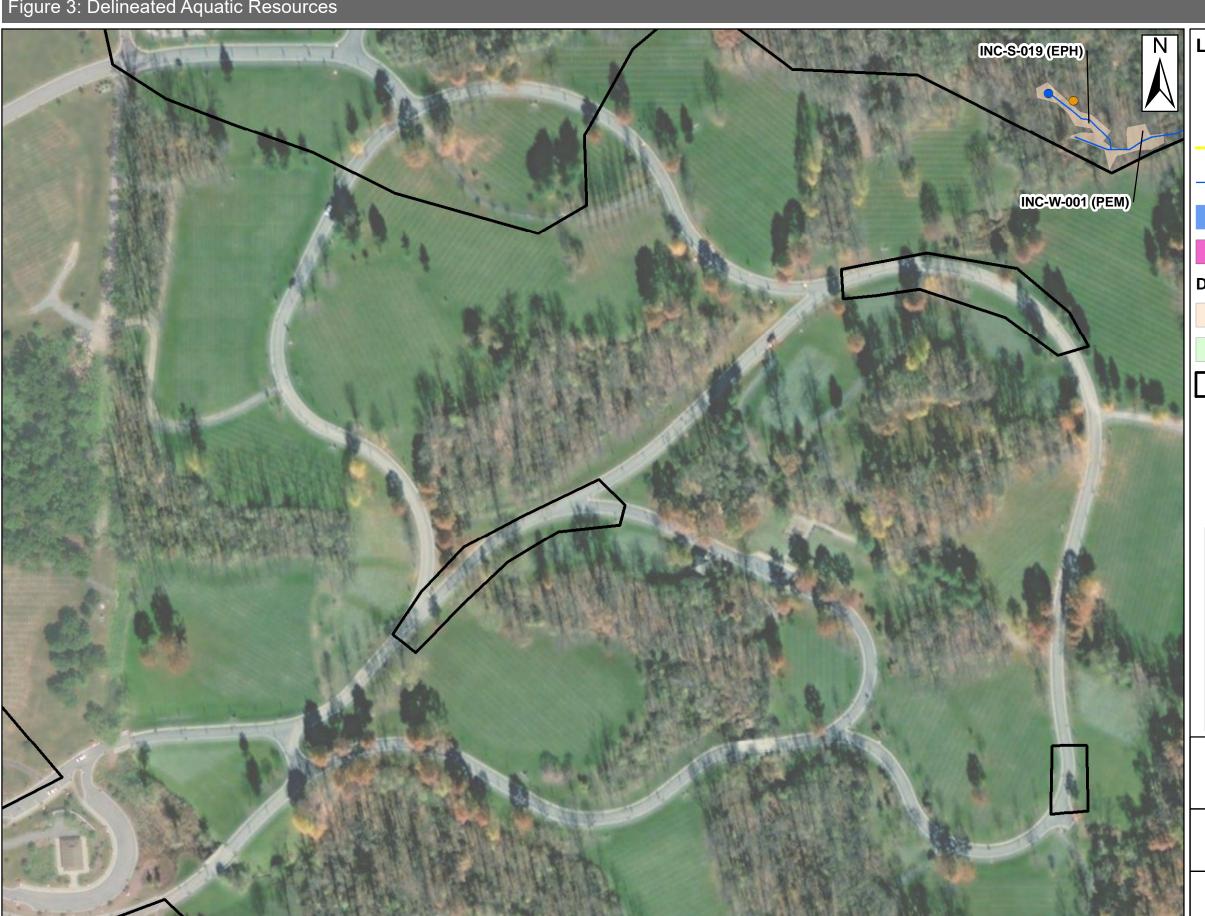


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150 ☐Feet 75

Created By: CMG



Legend

- Upland Sample Point
- Wetland Sample Point
 - Open End
 - Delineated Watercourse
- Delineated Watercourse Area
- Stormwater Basin

Delineated Wetland Cowardin Classification

Page 5 of 10

- Palustrine Emergent (PEM)
- PEM/Vernal Pool
- Study Area



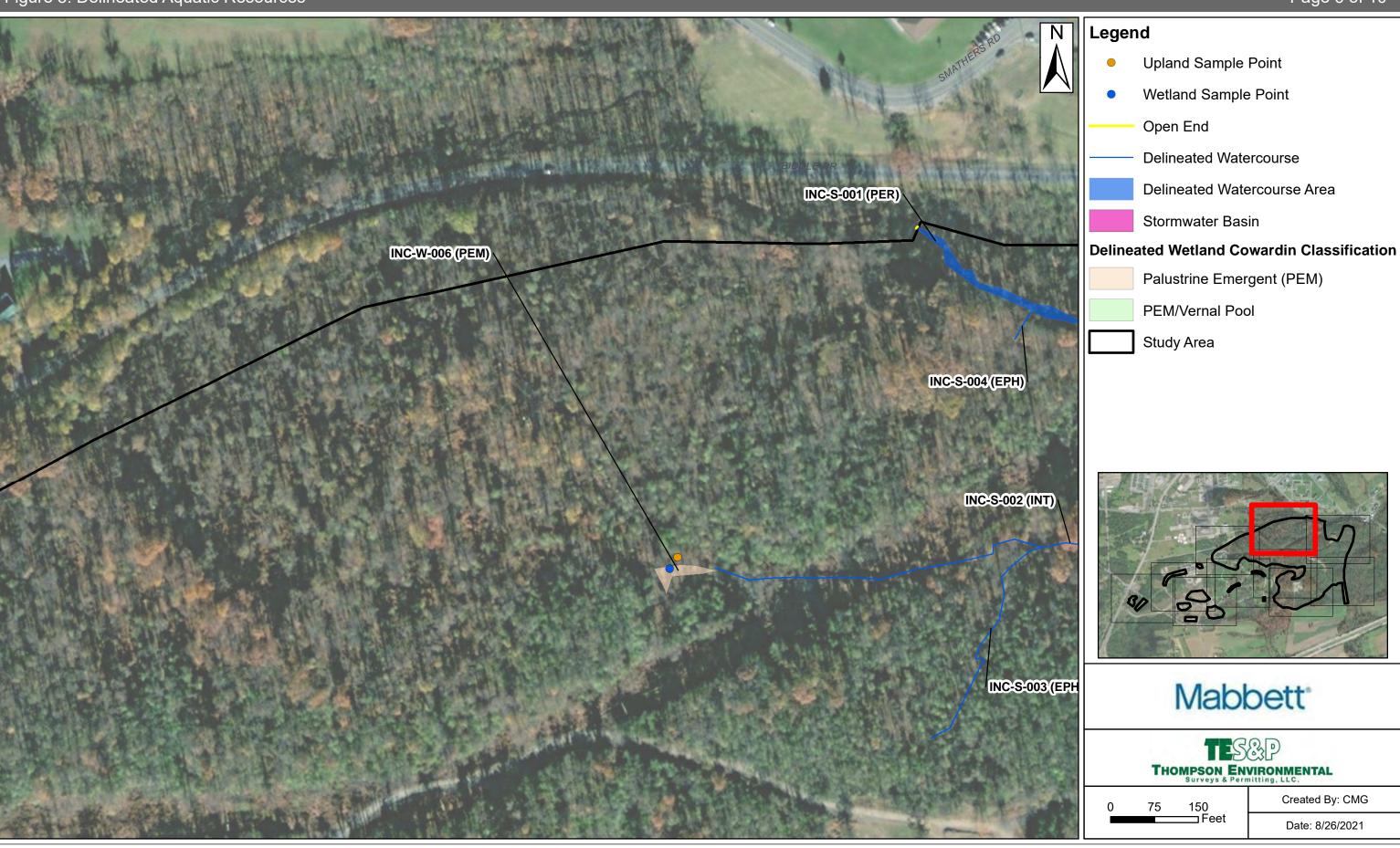
Mabbett[®]



0 75 150 Feet Created By: CMG

Created By: CMG





INC-S-016A (EPH)

INC-W-010 (PEM)

INC-S-016B (EPH)



Mabbett*



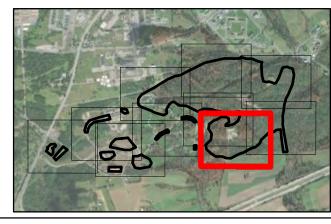
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INC-W-010 (PEM)

INC-W-008 (PEM)

INC-W-009 (PEM)

INC-S-015 (INT)



Mabbett*



0 75 150 Feet

INC-S-013 (INT)

BOUNDARY RD

INC-W-007 (PEM)

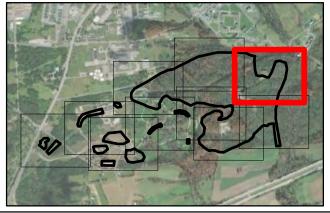
INC-S-014 (EPH)

INC-S-016 (EPH)

Created By: CMG

INC-S-010 (EPH)

INC-S-011 (EPH)



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0 75 150 Feet Created By: CMG

Appendix B

USACE Regional Supplement Wetland Determination Data Forms

Project/Site: Indiantown Gap Na	ational Cemetery Expansion Project	City/County: East Hanover,	, Lebanon Co. Sampling Date: 07-Oct-20
Applicant/Owner: Mabbett & Ass	sociates, Inc.	State:	PA Sampling Point: INC-W-001 (PEM)
Investigator(s): Bridger Thomps	son	Section, Township, Range:	S TR
Landform (hillslope, terrace, etc.	:): Channel (active)	Local relief (concave, convex	x, none): concave Slope: 5.2 % / 3.0 °
Subregion (LRR or MLRA): M	LRA 147 in LRR S Lat.	: 40.42326035 L	Long.: -76.56311225 Datum: NAD-83
_	ikert channery silt loam, 15 to 25 per		NWI classification: R4SBC
Are climatic/hydrologic conditio	ons on the site typical for this time of y	year? Yes 🔾 No 💿 (If r	no, explain in Remarks.)
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$, or Hydrology 🔲 significan	ntly disturbed? Are "Norm	nal Circumstances" present? Yes No
Are Vegetation, Soil	, or Hydrology naturally		d, explain any answers in Remarks.)
Summary of Findings -	- Attach site map showing	sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Presen	nt? Yes • No O		
Hydric Soil Present?	Yes 💿 No 🔾	Is the Sampled Area	a Yes ● No ○
Wetland Hydrology Present?	Yes ● No ○	within a Wetland?	165 C 110 C
Remarks:		'	
			shallow depression along a small watercourse soil conditions with low chroma redox soils.
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of 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 Im Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water Present? Yewater Table Present? Yesaturation Present?	of one required; check all that apply) True Aquatic Plar Hydrogen Sulfide Oxidized Rhizospi Presence of Redu Recent Iron Redu Thin Muck Surfac Other (Explain in	nts (B14) Prodor (C1) Prodor (C1) Prodor (C3) Prodor (C4) Prodor (C4) Prodor (C6) Prodor (C7) Prodor (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)
Remarks:			
The primary source of hydrolog	gy is associated with the discharge of	a seasal groundwater seep th	nat is confined in a eroded channel.

		Dominant		Sampling Point: <u>INC-W-001 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:3(A)
2	0	0.0%		
3		0.0%		Total Number of Dominant Species Across All Strata: 3 (B)
4.	_	0.0%		Species Across All Strata.
• •		0.0%		Percent of dominant Species
5		0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
6		0.0%		Paradama Valencia de la constante de
7				Prevalence Index worksheet:
8		0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	0 :	= Total Cove	er	OBL species 20 x 1 = 20
1	_	0.0%		FACW species $10 \times 2 = 20$
2		0.0%		FAC species $\underline{60}$ x 3 = $\underline{180}$
3		0.0%		FACU species $0 \times 4 = 0$
		0.0%		UPL species $0 \times 5 = 0$
4		0.0%		Column Totals: 90 (A) 220 (B)
5		0.0%		
6				Prevalence Index = B/A = 2.444
7		0.0%		Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	0	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)	0	= Total Cove	er	Morphological Adaptations ¹ (Provide supporting
1. Lindera benzoin	10	✓ 100.0%	FAC	data in Remarks or on a separate sheet)
2.	0	0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
		0.0%		¹ Indicators of hydric soil and wetland hydrology must
3		0.0%		be present, unless disturbed or problematic.
4				Definition of Vegetation Strata:
5		0.0%		Definition of Vegetation Strata:
6	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), regardless
Herb Stratum (Plot size: 10 feet)	10	= Total Cove	er	of height.
1. Microstegium vimineum	50	✓ 62.5%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Glyceria striata	20	25.0%	OBL	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Pilea pumila	10	12.5%	FACW	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
5	0	0.0%		in height.
	0	0.0%		
6		0.0%		Five Vegetation Strata:
7				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				Sapling stratum – Consists of woody plants, excluding woody
10	0			vines, approximately 20 ft (6 m) or more in height and less than
11	0			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.
	80	= Total Cove	er	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	0.0%		
5				Hydrophytic
6				Vegetation Yes • No •
	0	= Total Cov	er	
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-001 (PEM)

Profile Descr	Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth	Matrix Redox Features				_							
(inches)	Color (n			Color	(moist)	%_	Type 1	Loc²	Texture City Leaves	Rem	arks	
0-4	10YR	4/2	100						Silt Loam			
4-12	10YR	4/1	80	2.5YR	5/8	20	_ <u>C</u>	M	Silty Clay			
12-20	10YR	5/1	80	2.5YR	5/8	20	С	M	Clay Loam			
				-	-							
-										•		
-	-								-			
									-			
1		Daniela	- DM D-d	d Matrix	CC. C		- 1 6 1 6		History DL David Linia M. M.	_ t		
		-Depletio	n. RM=Red	uced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	iins ²Loca	ation: PL=Pore Lining. M=M			
Hydric Soil I						6 7)			Indicators for Probl	ematic Hydric	: Soils ³ :	
Histosol (•				k Surface ((S8) (MLRA	147 140)	2 cm Muck (A10)	(MLRA 147)		
Black Hist	pedon (A2)						(58) (MLRA 1LRA 147, 1		Coast Prairie Red	ox (A16)		
	Sulfide (A4)				ny Gleyed			.40)	(MLRA 147,148)			
	Layers (A5)				leted Matri		,		Piedmont Floodp (MLRA 136, 147)			
	k (A10) (LRR I	N)			ox Dark Su	. ,					2)	
	Below Dark Su		.11)		leted Dark		7)		Very Shallow Dar		2)	
	k Surface (A12	•	/		ox Depress		,		Other (Explain in	Remarks)		
	ick Mineral (S1	•	١.			se Masses ((F12) (LRR	N,				
MLRA 147	7, 148)	, (,		A 136)							
Sandy Gle	eyed Matrix (S	4)					LRA 136, 12		3 Indicators of	hydrophytic yd	agotation and	
Sandy Re							s (F19) (MLF		³ Indicators of hydrophytic vegetation and wetland hydrology must be present,			
Stripped N	Matrix (S6)			Red	Parent Ma	terial (F21)) (MLRA 12	7, 147)	unless disturbed or problematic.			
Restrictive L	ayer (if obse	rved):										
Type:												
Depth (inc	hes):								Hydric Soil Present?	Yes 💿	No O	
Remarks:									1			
Surface water	r infiltration	is slight	ly restricte	ed by a sha	allow clay	layer.						
			•	•		•						
i												
i												
ı												
1												

Project/Site: Indiantown Gap N	National Cemetery Expa	nsion Project C i	ity/County: East Hanover, L	ebanon Co.	Sampling D	Pate: 07-Oct-20
Applicant/Owner: Mabbett & A	ssociates, Inc.		State: P	A S	Sampling Point:	INC-W-001 (UPL)
Investigator(s): Bridger Thom	pson	S	Section, Township, Range: S	<u> </u>	т	R
Landform (hillslope, terrace, et	c.): Undulating	Lo	cal relief (concave, convex,	none): flat	Slop	e:0.0 % /0.0 °
Subregion (LRR or MLRA):	ULRA 147 in LRR S),42322812 Lo	ng.: -76.562		<u>Datum:</u> NAD-83
Soil Map Unit Name: WeD-We					assification: N//	_
			\sim			-
Are climatic/hydrologic conditi			•	o, explain in R	•	Yes ● No ○
Are Vegetation, Soil	, or Hydrology	y 🗌 significantly d	listurbed? Are "Norma	al Circumstanc	es" present?	res ♥ No ∪
Are Vegetation $\ \ \ \ \ \ \ \ $, Soil	, or Hydrology	y 🗌 naturally prob	olematic? (If needed,	explain any a	nswers in Remar	ks.)
Summary of Findings	- Attach site m	nap showing san	npling point locatio	ns, transe	cts, importa	nt features, etc.
Hydrophytic Vegetation Prese		o O				
Hydric Soil Present?		o •	Is the Sampled Area	Yes O No	•	
Wetland Hydrology Present?	Yes O N	o •	within a Wetland?	105 0 110		
Remarks:						
Upland data point collected t grounds.	o verify the wetland	boundary. The data po	oint is located in a wooded/	shrubby lot ac	ljacent to a main	itained cemetery
Hydrology						
Wetland Hydrology Indicators	5:			Secondary In	dicators (minimum	of two required)
Primary Indicators (minimum	of one required; ch			Surface S	oil Cracks (B6)	<u> </u>
Surface Water (A1)	L	True Aquatic Plants (B		Sparsely	Vegetated Concave	Surface (B8)
High Water Table (A2)	Ĺ	Hydrogen Sulfide Odoi	• •	Drainage	Patterns (B10)	
Saturation (A3)	Ĺ	Oxidized Rhizospheres	along Living Roots (C3)	Moss Trir	n Lines (B16)	
Water Marks (B1)	L	Presence of Reduced 1	Iron (C4)	Dry Seaso	on Water Table (C2)
Sediment Deposits (B2)	L	Recent Iron Reduction	in Tilled Soils (C6)		Burrows (C8)	
Drift deposits (B3)	L	Thin Muck Surface (C7	7)		n Visible on Aerial I	
☐ Algal Mat or Crust (B4)	L	Other (Explain in Rema	arks)		r Stressed Plants (I	01)
☐ Iron Deposits (B5)					hic Position (D2)	
Inundation Visible on Aerial I	magery (B7)				aquitard (D3)	
Water-Stained Leaves (B9)					ographic Relief (D4)	
Aquatic Fauna (B13)				☐ FAC-neut	ral Test (D5)	
Field Observations:	′es ○ No •	Depth (inches):				
	'es ○ No •	Depth (inches):	Wetland Hyd	irology Presen	t? Yes	No •
Saturation Present? (includes capillary fringe)	es O No 💿	Depth (inches):	————	irology Fresch	100	110
Describe Recorded Data (stre	am gauge, monitorir	ng well, aerial photos, p	previous inspections), if ava	ilable:		
Remarks:						
	o rogion is ovnorion	aina yang dag draught l	ika canditions			
No evidence of hydrology. Th	e region is experient	ang very ary arought i	ike conditions.			

		Dominan		Sampling Point: <u>INC-W-001 (UPL)</u>
	Absolute % Cover	ixcii5ti at		Dominance Test worksheet:
1. Carya ovata	30	✓ 75.0%	6 FACU	Number of Dominant Species That are OBL, FACW, or FAC:
2. Acer rubrum	10	2 5.0%	6 FAC	Total Number of Demisers
3	0	0.0%	<u> </u>	Total Number of Dominant Species Across All Strata:5(B)
4	_	0.0%	<u> </u>	
5	0	0.0%)	Percent of dominant Species That Are OBL_FACW_or_FAC: 60.0% (A/B)
6		0.0%	<u> </u>	That Are OBL, FACW, or FAC: 60.0% (A/B)
7	0	0.0%)	Prevalence Index worksheet:
8	0_	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	40	= Total Cov	/er	OBL species
1		0.0%	<u> </u>	FACW species $0 \times 2 = 0$
2		0.0%	<u> </u>	FAC species $80 \times 3 = 240$
3	0	0.0%	<u> </u>	FACU species $40 \times 4 = 160$
4	0	0.0%)	UPL species $0 \times 5 = 0$
5	0	0.0%)	Column Totals: 120 (A) 400 (B)
6	_	0.0%)	Prevalence Index = B/A = 3.333
7	-	0.0%)	<u> </u>
8		0.0%)	Hydrophytic Vegetation Indicators: Rapid Test for Hydrophytic Vegetation
9		0.0%)	✓ Dominance Test is > 50%
10		0.0%)	Prevalence Index is \$3.0 1
	_	= Total Cov	/er	
Shrub Stratum (Plot size: 15 feet)	10	✓ 50.0%	6 FACU	Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1. Cornus florida		50.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2. Lindera benzoin		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				Tree stratum – Consists of woody plants, excluding vines, 3 in.
7	0			(7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	20	= Total Cov	/er	of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	60	100.09	%_FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0	0.0%		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	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5				
6				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
9	0	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 than
11	0	0.0%		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.
	60	= Total Cov	/er	Herb stratum – Consists of all herbaceous (non-woody) plants,
1				including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m)
2	0			in height.
3				Woody vines – Consists of all woody vines, regardless of height.
4		0.0%		The state of the s
5	0			Hydrophytic
6	0	0.0%		Vegetation Var A Na O
	0	= Total Co	ver	Present? Yes W No
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-001 (UPL)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)										
Depth	Matrix			dox Featı	ıres			-		
(inches)	Color (moist)		Color (moist)	%_	Type 1	Loc²	Texture	Remarks		
0-12	10YR 5/3	100					Silt Loam			
12-20	10YR 5/3	95	2.5YR 5/6	_ 5	_ <u>C</u>	M	Clay Loam			
				-						
¹ Type: C=Cond	centration. D=Depletion	on. RM=Red	uced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix		
Hydric Soil I	ndicators:						Indicators for Proble	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)				
Black Histi	ic (A3)		Thin Dark Surfa	ace (S9) (N	1LRA 147, 1	.48)	Coast Prairie Redo (MLRA 147,148)	ox (A16)		
	Sulfide (A4)		Loamy Gleyed	Matrix (F2)		Piedmont Floodpl	lain Soils (F19)		
	Layers (A5)		Depleted Matri				(MLRA 136, 147)			
2 cm Muck	k (A10) (LRR N)		Redox Dark Su	` ,			Very Shallow Dar	k Surface (TF12)		
Depleted I	Below Dark Surface (A	A11)	Depleted Dark		7)		Other (Explain in	Remarks)		
Thick Dark	k Surface (A12)		Redox Depress	. ,						
Sandy Mu MLRA 147	ck Mineral (S1) (LRR I ', 148)	N,	Iron-Manganes MLRA 136)	se Masses	(F12) (LRR	N,				
☐ Sandy Gle	yed Matrix (S4)		Umbric Surface	e (F13) (M	LRA 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	Matrix (S6)		Red Parent Ma	terial (F21) (MLRA 12	7, 147)		sturbed or problematic.		
Postrictivo I	ayer (if observed):									
Type:										
Depth (inch							Hydric Soil Present?	Yes O No 💿		
	ics)									
Remarks:										

Project/Site: Indiantown Ga	p National Cemetery Expansion Project	City/County: East	Hanover, Lebanon Co.	Sampling Da	ate: 07-Oct-20
Applicant/Owner: Mabbett 8	Associates, Inc.		State: PA	Sampling Point:	INC-W-002 (PEM)
Investigator(s): Bridger Tho	ompson	Section, Township	, Range: S	т	R
Landform (hillslope, terrace,	etc.): Footslope	Local relief (concave	e, convex, none): (concave Slope	∷ _3.5 %/ 2.0°
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.: 40.42458409	Long.: -76,5		<u>Datum:</u> NAD-83
	Comly silt loam, 3 to 8 percent slop			classification: N/A	
		O (
	litions on the site typical for this tin			,	Yes No
Are Vegetation, Soi	I . , or Hydrology . sign	nificantly disturbed?	Are "Normal Circumsta	inces" present?	res 💌 No 🔾
Are Vegetation $\ \ \ \ \ \ \ $, Soi	l 🗌 , or Hydrology 🗌 nat	curally problematic? (If needed, explain an	y answers in Remark	is.)
Summary of Finding	s - Attach site map show	ing sampling point	locations, trans	sects, importar	nt features, etc.
Hydrophytic Vegetation Pre	esent? Yes No				
Hydric Soil Present?	Yes ● No ○	Is the Sam	pled Area Yes •	u. (
Wetland Hydrology Present	. Yes ● No ○	within a W		10 🔾	
Remarks:	-				
wetland contains multiple	ed to document the existing conditi persistent groundwater discharge a dominatedby bulrush and sensitive	areas. The wetland boundar			
Hydrology					
Wetland Hydrology Indicate	ors:		Secondary	/ Indicators (minimum o	of two required)
Primary Indicators (minimum Surface Water (A1) If 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 Aeria Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	um of one required; check all that a True Aqua Hydrogen Oxidized Recent Iro Recent Iro Thin Muck Other (Expal Imagery (B7)	stic Plants (B14) Sulfide Odor (C1) Rhizospheres along Living Roots of Reduced Iron (C4) on Reduction in Tilled Soils (C6) Surface (C7) polain in Remarks) suches): 1.5 nches): 3 nches): 0	Surfac Sparse Draina (C3) Moss - Crayfis Satura Stunte Geome Shallo Microt FAC-ne	the Soil Cracks (B6) thely Vegetated Concave in the Soil Cracks (B10) Trim Lines (B16) the Burrows (C8) the Burrows (C8) the Or Stressed Plants (Dorphic Position (D2) the Aquitard (D3) topographic Relief (D4) the Boil Crack (D5)	Surface (B8) magery (C9)
Remarks:					
The region is experiencing	very dry and drought like condition	IS.			

		Dominant		Sampling Point: <u>INC-W-002 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 2 (B)
4		0.0%		(0)
5		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	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	:	= Total Cove	r	OBL species 30 x 1 = 30
1	_	0.0%		FACW species $\underline{20}$ x 2 = $\underline{40}$
2		0.0%		FAC species $\underline{50}$ x 3 = $\underline{150}$
3		0.0%		FACU species $0 \times 4 = 0$
		0.0%		UPL species $0 \times 5 = 0$
4		0.0%		Column Totals: 100 (A) 220 (B)
5		0.0%		
6		0.0%		Prevalence Index = B/A = 2.200
7		0.0%		Hydrophytic Vegetation Indicators:
8		0.0%		Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	_			✓ Prevalence Index is ≤3.0 1
Shrub Stratum (Plot size:)		= Total Cove	r	Morphological Adaptations 1 (Provide supporting
1				data in Remarks or on a separate sheet)
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4				i i
5	0	0.0%		Definition of Vegetation Strata:
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), regardless
Herb Stratum (Plot size: 10 feet)	=	= Total Cove	r	of height.
1. Microstegium vimineum	50	50.0%	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. Typha latifolia	20	20.0%	OBL	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Scirpus atrovirens	10	10.0%	OBL	regardless of size, and all other plants less than 3.28 ft tall.
4. Juncus effusus	10	10.0%_	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Onoclea sensibilis	10	10.0%_	FACW	in neight.
6	0	0.0%_		Five Vegetation Strata:
7	0	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	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 than
11	0	0.0%		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.
	100=	= Total Cove	r	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 m)
2	0	0.0%_		in height.
3	0			Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%_		Hydrophytic
6	0	0.0%		Vegetation No. A. N. C.
	0	= Total Cove	er	Present? Yes No
Remarks: (Include photo numbers here or on a separate shee	:t.)			1
	,			

Soil Sampling Point: INC-W-002 (PEM)

Project/Site: Indiantown Gap National	al Cemetery Expansion Project	City/County: East Hanover, L	ebanon Co. Sampling Date: 07-Oct-20
Applicant/Owner: Mabbett & Associa	ates, Inc.	State: P	Sampling Point: INC-W-002 (UPL)
Investigator(s): Bridger Thompson		Section, Township, Range: S	5 TR
Landform (hillslope, terrace, etc.):	Footslope	Local relief (concave, convex,	none): concave Slope: 7.0 % / 4.0
Subregion (LRR or MLRA):	Lat.:	40.424616 Lo	ng.: -76.566243
Soil Map Unit Name: CmB-Comly si		10.121010	NWI classification: N/A
Are climatic/hydrologic conditions o	on the site typical for this time of ve	ear? Yes O No 💿 (If no	o, explain in Remarks.)
Are Vegetation, Soil			Il Circumstances" present? Yes No
Are Vegetation, Soil			explain any answers in Remarks.)
-	, , ,	(ns, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes ○ No ●		
Hydric Soil Present?	Yes O No 💿	Is the Sampled Area	Yes ○ No ●
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?	165 0 110 0
Remarks:			
Hydrology			
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of or		- (D14)	Surface Soil Cracks (B6)
Surface Water (A1) High Water Table (A2)	True Aquatic Plant		Sparsely Vegetated Concave Surface (B8)
Saturation (A3)	Hydrogen Sulfide (odor (C1) eres along Living Roots (C3)	☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduc		Dry Season Water Table (C2)
Sediment Deposits (B2)		tion 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 R		Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)	Galler (Explain in 1)	(Ciridino)	Geomorphic Position (D2)
☐ 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			
Water Table Present? Yes	No Depth (inches):		Irology Present? Yes ○ No ●
Saturation Present? (includes capillary fringe) Yes	No • Depth (inches):	Wetland Hyd	Irology Present? Yes ○ No •
Describe Recorded Data (stream ga	auge, monitoring well, aerial photo	os, previous inspections), if ava	ilable:
, -			
Remarks:			
The region is experiencing very dry	y and drought like conditions.		

		—Species? –		Sampling Point: INC-W-002 (UPL)
	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Cover	Status	Number of Danisant Consis
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:1 (A)
		0.0%		That are obe, they, of the
2				Total Number of Dominant
3	0			Species Across All Strata:3(B)
4	0	0.0%		
5	0	0.0%		Percent of dominant Species
6		0.0%		That Are OBL, FACW, or FAC: 33.3% (A/B)
		0.0%		Paradama Zadama dalama
7				Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
(Diet sine)	0	= Total Cover		OBL species 0 x 1 = 0
Sapling-Sapling/Shrub Stratum (Plot size:)			FACW species 0 x 2 = 0
1	0	0.0%		
2	0	0.0%		<u> </u>
3	0	0.0%		FACU species $10 \times 4 = 40$
	•	0.0%		UPL species $30 \times 5 = 150$
4				Column Totals:100 (A)370 (B)
5	0			Column locals: 100 (A) 370 (S)
6	0	0.0%		Prevalence Index = B/A =3.700_
7	0	0.0%		Hudusub, dis Vanatation Tudiostano.
8	_	0.0%		Hydrophytic Vegetation Indicators:
		0.0%		Rapid Test for Hydrophytic Vegetation
9				☐ Dominance Test is > 50%
10	0	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: <u>15 feet</u>)	0	= Total Cover		Morphological Adaptations ¹ (Provide supporting
1. Elaeagnus umbellata	30	✓ 75.0%	UPL	data in Remarks or on a separate sheet)
0	10			Problematic Hydrophytic Vegetation ¹ (Explain)
2. Crataegus crus-galli			FACU	
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:
		0.0%		Four Vegetation Strata:
6				Tree stratum – Consists of woody plants, excluding vines, 3 in.
7		0.0%		(7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	40	= Total Cover		of height.
1. Setaria pumila	10	14.3%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding
	50	71.4%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Microstegium vimineum			FAC	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3	10	14.3%		, ,
4	0	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5.	0	0.0%		in neight.
6	0	0.0%		.
	0	0.0%		Five Vegetation Strata:
7		$\overline{}$		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
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 than
11		0.0%		3 in. (7.6 cm) DBH.
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
12				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,
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				-
3				Woody vines – Consists of all woody vines, regardless of height.
4	0	0.0%		
5	0	0.0%		Undershiele
6.		0.0%		Hydrophytic Vegetation
·-		= Total Cover		Present? Yes No •
		- rotal Covel	ı	
Remarks: (Include photo numbers here or on a separate shee	et.)			
·				

Soil Sampling Point: INC-W-002 (UPL)

						nfirm the a	absence of indicators.)			
Depth (inches)	Matrix Color (moist)		Color (moist)	ox Featur %	es Tvpe ¹	Loc ²	Texture	Remarks		
0-3	2.5Y 4/4	100	Color (moist)		TVDE	LOC-	Silt Loam	Kemarks		
							Clay Loam			
3-20	2.5Y 5/4						Clay Loan			
-										
1 Type: C-Cond	contration D-Deplet	tion DM-Dadu	ucad Matrix CS-Covered	d or Coated	Sand Gra	aine 21 oca	tion: PL=Pore Lining. M=Matrix			
		uon. KM-Reuc	iced Matrix, C5=Coverer	J OI COALEG	Sallu Gla	allis -Loca				
Hydric Soil I Histosol (A			☐ Dark Surface (S	7)			Indicators for Problematic Hy	/dric Soils ³ :		
` =	edon (A2)		Polyvalue Below		8) (MI DA	147 148)	2 cm Muck (A10) (MLRA 14	7)		
Black Histi			Thin Dark Surfa				Coast Prairie Redox (A16)			
	Sulfide (A4)		Loamy Gleyed N			. 10)	(MLRA 147,148)			
	Layers (A5)		Depleted Matrix				Piedmont Floodplain Soils (F (MLRA 136, 147)	F19)		
	(A10) (LRR N)		Redox Dark Sur				Very Shallow Dark Surface (/TE12\		
	Below Dark Surface	(A11)	Depleted Dark S	. ,)					
	k Surface (A12)	(**==)	Redox Depression				Other (Explain in Remarks)			
	ck Mineral (S1) (LRR	R N,	Iron-Manganese MLRA 136)		12) (LRR	N,				
	yed Matrix (S4)		Umbric Surface	(F13) (MLR	A 136, 12	22)				
Sandy Glo				Piedmont Floodplain Soils (F19) (MLRA 148)			³ Indicators of hydrophytic vegetation and			
Stripped N			Red Parent Mat				wetland hydrology must be present, unless disturbed or problematic.			
	()					,, =,	1	problemade.		
	ayer (if observed):	:								
Type:	`						Hydric Soil Present? Yes	○ No ●		
Depth (inch	nes):						,, , , , , , , , , , , , , , , , , , , ,			
Remarks:										

Project/Site: Indiantown Gap	National Cemetery Expansion Project	City/County: East Hanover,	Lebanon Co. Sampling Date: 07-Oct-20
Applicant/Owner: Mabbett &	Associates, Inc.	State:	PA Sampling Point: INC-W-003 (PEM)
Investigator(s): Bridger Thon	npson	Section, Township, Range:	S TR
Landform (hillslope, terrace, e	etc.): Channel (active)	Local relief (concave, convex	, none): concave Slope: 10.5 % / 6.0
Subregion (LRR or MLRA):	MLRA 147 in LRR S	– ht.: 40.42455362 L	ong.: -76.56571245
	omly silt loam, 3 to 8 percent slopes	10.12133302	NWI classification: N/A
Are climatic/hydrologic condit	tions on the site typical for this time o	f year? Yes O No 💿 (If r	no, explain in Remarks.)
Are Vegetation \Box , Soil	, or Hydrology signific	antly disturbed? Are "Norm	nal Circumstances" present? Yes No
Are Vegetation \Box , Soil	, or Hydrology natural	ly problematic? (If needed	d, explain any answers in Remarks.)
Summary of Findings	s - Attach site map showing	g sampling point locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Pres	ent? Yes No		
Hydric Soil Present?	Yes No	Is the Sampled Area	Yes ● No ○
Wetland Hydrology Present?	Yes No	within a Wetland?	
Remarks:			
	seasonal groundwater discharge with		light gully on a moderately sloped hillside. The ary is defined by the saturated soil conditions and
Hydrology			
Wetland Hydrology Indicator	rs:		Secondary Indicators (minimum of two required)
Primary Indicators (minimur	m of one required; check all that appl	у)	Surface Soil Cracks (B6)
✓ Surface Water (A1)	True Aquatic P	lants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfi	de Odor (C1)	Drainage Patterns (B10)
✓ Saturation (A3)	Oxidized Rhizo	spheres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Re	educed Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Re	eduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surf	face (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:			
	Yes No Depth (inche	s):	
	Yes O No O Depth (inche		rdrology Present? Yes No
Saturation Present? (includes capillary fringe)	Yes No Depth (inche	wetiand Hy s):	/drology Present? Yes ● No ○
	eam gauge, monitoring well, aerial ph	notos, previous inspections), if av	ailable:
Remarks:			
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
The region is experiencing v	ery dry and drought like conditions.		

(2)	Absolute		ecies? -		
Tree Stratum (Plot size:)	% Cover		l.Strat. ver	Indicator Status	
1	0		0.0%		Number of Dominant Species That are OBL, FACW, or FAC:
2	0		0.0%		Total Number of Demisers
3			0.0%		Total Number of Dominant Species Across All Strata: 2 (B)
4			0.0%		(-)
5			0.0%		Percent of dominant Species
6	_		0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
7		$\overline{\Box}$	0.0%		Prevalence Index worksheet:
8		$\overline{\Box}$	0.0%		Total % Cover of: Multiply by:
		 Tot=	tal Cover		OBL species 20 x 1 = 20
Sapling-Sapling/Shrub Stratum (Plot size:)		car core		FACW species $30 \times 2 = 60$
1	0	\square	0.0%		
2	0		0.0%		
3	0		0.0%		FACU species $0 \times 4 = 0$
4	0		0.0%		UPL species $0 \times 5 = 0$
5			0.0%		Column Totals: 100 (A) 230 (B)
6	_		0.0%		Prevalence Index = B/A = 2.300
7	0		0.0%		Hydrophytic Vegetation Indicators:
8			0.0%		
9			0.0%		Rapid Test for Hydrophytic Vegetation
0		П	0.0%		✓ Dominance Test is > 50%
	_	 - Tot	tal Cover		Y Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		_ 10			Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1		<u>H</u> -	0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2		Ц-	0.0%		Problematic nyurophytic vegetation (Explain)
3		Ц.	0.0%		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4	0	\sqcup	0.0%		
5	0	\square	0.0%		Definition of Vegetation Strata:
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), regardless
Herb Stratum (Plot size: 10 feet)	0 :	= To	tal Cover	•	of height.
1. Microstegium vimineum	50	~	50.0%	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. Galimura atmostituena			20.0%	OBL	Herb stratum – Consists of all herbaceous (non-woody) plants,
Scirpus atrovirens Persicaria pensylvanica	10		10.0%	FACW	regardless of size, and all other plants less than 3.28 ft tall.
	10	Π	10.0%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Pilea pumila	10	\Box	10.0%	FACW	in height.
5. Impatiens capensis		\Box	0.0%	TACW	
6		Η-			Five Vegetation Strata:
7		Η-	0.0%		Tree - Woody plants, excluding woody vines, approximately 20
8		Н-	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	Ц.	0.0%		Sapling stratum – Consists of woody plants, excluding woody
0	0	Ц.	0.0%		vines, approximately 20 ft (6 m) or more in height and less than
1	0	Ш.	0.0%		3 in. (7.6 cm) DBH.
2	0	\square	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:)	100 :	= Tot	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.
			0.0%		Woody vines – Consists of all woody vines, regardless of
3			0.0%		height.
4					
5			0.0%		Hydrophytic
6	0	\square_{\perp}	0.0%		Vegetation Present? Yes No
	0	= To	tal Cove	r	Lieselliti 100 0 110 0

Soil Sampling Point: INC-W-003 (PEM)

Profile Descr		the depth n	absence of indicators.)					
Depth	Matrix			dox Featu	ires 1	1	T	Damester
(inches) 0-20	Color (moist) 2.5Y 5/1	%	Color (moist) 5YR 5/6	% 10	Tvpe 1	<u>Loc²</u> M	<u>Texture</u> Silt Loam	Remarks
	2.5Y 5/1		5YR _5/6				Siit Loairi	
							-	
				-			-	
		n. RM=Reduc	ed Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I							Indicators for Proble	ematic Hydric Soils ³ :
Histosol (,		Dark Surface (2 cm Muck (A10)	(MLRA 147)
	pedon (A2)		Polyvalue Belo				Coast Prairie Red	
☐ Black Hist			Thin Dark Surfa			48)	(MLRA 147,148)	v*/
	Sulfide (A4)		Loamy Gleyed)		Piedmont Floodpl	
	Layers (A5)		✓ Depleted Matri	. ,			(MLRA 136, 147)	
	k (A10) (LRR N)	443	Redox Dark Su Depleted Dark		7)		☐ Very Shallow Dar	
_ '	Below Dark Surface (A	11)	Redox Depress	-	/)		Other (Explain in	Remarks)
	k Surface (A12)		☐ Iron-Manganes		F12) (I RR N	J		
MLRA 147	ck Mineral (S1) (LRR N ', 148)	١,	MLRA 136)					
	yed Matrix (S4)		Umbric Surface				3 Indicators of	hydrophytic vegetation and
Sandy Red			☐ Piedmont Floo				wetland hyd	drology must be present,
☐ Stripped N	Matrix (S6)		Red Parent Ma	terial (F21)) (MLRA 127	', 147)	unless di	sturbed or problematic.
Restrictive La	ayer (if observed):							
Type:								
Depth (incl	nes):						Hydric Soil Present?	Yes No
Remarks:								

Project/Site: Indiantown Gap	National Cemetery Expansion Project	City/County: East Hanover,	Lebanon Co. Sampling Date: 07-Oct-20
Applicant/Owner: Mabbett &	Associates, Inc.	State:	
Investigator(s): Bridger Thon	npson	Section, Township, Range:	
andform (hillslope, terrace, e	tc.): Gulch or Gully	Local relief (concave, convex	x, none): convex Slope: 10.5 % / 6.0 °
		40.42457045 L	ong.: -76.56566819
	omly silt loam, 3 to 8 percent slopes	40.42457045	NWI classification: N/A
Are climatic/hydrologic condit	tions on the site typical for this time of ye	ar? Yes O No 💿 (If r	no, explain in Remarks.)
Are Vegetation , Soil		•	nal Circumstances" present? Yes No
Are Vegetation , Soil			d, explain any answers in Remarks.)
Summary of Findings	s - Attach site map showing s	ampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Pres	ent? Yes O No 🖲		
Hydric Soil Present?	Yes ○ No •	Is the Sampled Area	Yes O No 💿
Wetland Hydrology Present?	Yes ○ No •	within a Wetland?	res U NU U
Remarks: Upland data point collected wetland boundary.	to verify the wetland boundary. The data	a point is located in a shallow	gully in a wooded/shrubby area adjacent to the
Hydrology			
Wetland Hydrology Indicator	rs:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum	m of one required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plants	s (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide (Odor (C1)	Drainage Patterns (B10)
Saturation (A3)	Oxidized Rhizosphe	eres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduc		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 Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in R	emarks)	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:	Yes No Depth (inches):		
	, ,		
	Yes O No Depth (inches):	Wetland Hy	ydrology Present? Yes O No •
Saturation Present? (includes capillary fringe)	Yes O No Depth (inches):		yulology Present: 165 © 116 ©
· · · · · · · · · · · · · · · · · · ·	eam gauge, monitoring well, aerial photo	s, previous inspections), if av	vailable:
Damarka			
Remarks:			
The region is experiencing v	ery dry and drought like conditions.		

			C-			Sampling Point: <u>INC-W-003 (UPL)</u>
Tree	Stratum (Plot size: <u>30 feet</u>)	Absolute % Cover	Re	ecies? - el.Strat. over	Indicator Status	Dominance Test worksheet:
1. <u>C</u>	arya ovata		V	100.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:
2		0	Ш	0.0%		Total Number of Dominant
3		0		0.0%		Species Across All Strata: 4 (B)
				0.0%		
				0.0%		Percent of dominant Species
		_		0.0%		That Are OBL, FACW, or FAC: 50.0% (A/B)
				0.0%		Prevalence Index worksheet:
				0.0%		Total % Cover of: Multiply by:
	ng-Sapling/Shrub Stratum (Plot size:	20	= To	tal Cover		OBL species 0 x 1 = 0
		_		0.00/		FACW species $0 \times 2 = 0$
				0.0%		FAC species <u>40</u> x 3 = <u>120</u>
		_		0.0%		FACU species $30 \times 4 = 120$
3			\square	0.0%		20 400
4		0	\sqcup	0.0%		
5		0	Ш	0.0%		Column Totals: 90 (A) 340 (B)
•				0.0%		Prevalence Index = B/A = <u>3.778</u>
7			\square	0.0%		Hydrophytic Vegetation Indicators:
8			\sqcup	0.0%		Rapid Test for Hydrophytic Vegetation
9		0	Ш	0.0%		Dominance Test is > 50%
0		0		0.0%		Prevalence Index is ≤3.0 ¹
	Stratum (Plot size: _15 feet)	_	= To	tal Cover		Morphological Adaptations ¹ (Provide supporting
	aeagnus umbellata	20	~	33.3%	UPL	data in Remarks or on a separate sheet)
				33.3%	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
				16.7%	FACU	¹ Indicators of hydric soil and wetland hydrology must
	erberis thunbergii		\Box	16.7%	FAC	be present, unless disturbed or problematic.
	ıbus idaeus			0.0%	FAC	Definition of Vegetation Strata:
			\Box	0.0%		Four Vegetation Strata:
				0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
				tal Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Herb	Stratum (Plot size: 10 feet)		_			Sapling/shrub stratum – Consists of woody plants, excluding
1. <u>M</u>	crostegium vimineum		✓	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2		0	\square	0.0%		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		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5		0		0.0%		in neight.
6		0		0.0%		Five Vegetation Strata:
7		0		0.0%		
				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
				0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
			\Box	0.0%		Shrub stratum – Consists of woody plants, excluding woody
			 = To	otal 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		0.0%		species, except woody vines, less than approximately 3 ft (1 m)
				0.0%		in height.
3				0.0%		Woody vines – Consists of all woody vines, regardless of
			\square	0.0%		height.
5		0		0.0%		Hydrophytic
6		0		0.0%		Vegetation
				otal Cove		Present? Yes No •
		0	= 10	otal Cove		

Soil Sampling Point: INC-W-003 (UPL)

Profile Descri	ption: (Describe to	the depth r	needed to document	the indic	ator or co	nfirm the a	absence of indicators.)				
Depth	Matrix		Red	lox Featu	ıres						
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Tvpe 1	Loc2	Texture	Remarks			
0-20	2.5Y 4/3	100					Silt Loam				
				-							
¹ Type: C=Conc	entration. D=Depletio	n. RM=Redu	ced Matrix, CS=Covere	d or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix			
Hydric Soil Ir			<u> </u>								
Histosol (A			Dark Surface (S	37)				ematic Hydric Soils ³ :			
Histic Epip			Polyvalue Belov	,	CQ) (MI DA	147 149)	2 cm Muck (A10)	(MLRA 147)			
Black Histic			Thin Dark Surfa				Coast Prairie Red	ox (A16)			
_						40)	(MLRA 147,148)				
	Sulfide (A4)		Loamy Gleyed I)		Piedmont Floodpl				
Stratified L			Depleted Matrix				(MLRA 136, 147)				
	(A10) (LRR N)		Redox Dark Sui	` ,			Very Shallow Dar	k Surface (TF12)			
	Below Dark Surface (A	11)	Depleted Dark		7)		Other (Explain in	Remarks)			
Thick Dark	Surface (A12)		Redox Depress								
Sandy Muc MLRA 147,	ck Mineral (S1) (LRR N , 148)	l,	☐ Iron-Manganes MLRA 136)	e Masses ((F12) (LRR I	Ν,					
	yed Matrix (S4)		Umbric Surface	(F13) (ML	RA 136, 12	2)					
Sandy Red			Piedmont Flood	lplain Soils	(F19) (MLF	RA 148)	³ Indicators of hydrophytic vegetation and				
Stripped M			Red Parent Mat					drology must be present, sturbed or problematic.			
	()			(. = 1)	, (, = ,	1				
Restrictive La	yer (if observed):										
Туре:											
Depth (inch	es):						Hydric Soil Present?	Yes O No 💿			
Remarks:											

Project/Site: Indiantown G	ap National Cemetery Expans	sion Project Ci	ty/County: East Hanover, L	ebanon Co.	Sampling D	ate: 07-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.		State: PA	Α :	Sampling Point:	INC-W-004 (PEM)
Investigator(s): Bridger Th	ompson	S	ection, Township, Range: \$	 S	т	R
Landform (hillslope, terrace	, etc.): Hillside	Loc	al relief (concave, convex,	none): COI	ncave Slope	e: <u>8.7</u> % / 5.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S		.42421048 Lo		666246	Datum: NAD-83
Soil Map Unit Name: CmB			1121210		lassification: N/A	4
Are climatic/hydrologic con	ditions on the site typical	for this time of year?	Yes \bigcirc No $lacktriangle$ (If no	o, explain in R	•	
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	il 🗌 , or Hydrology	significantly d	isturbed? Are "Norma	al Circumstano	ces" present?	Yes No
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	il 🗌 , or Hydrology	naturally prob	lematic? (If needed,	, explain any a	answers in Remarl	ks.)
Summary of Finding		ap showing san	pling point location	ns, transe	cts, importa	nt features, etc.
Hydrophytic Vegetation Pro						
Hydric Soil Present?	Yes No		Is the Sampled Area	Yes No	\circ	
Wetland Hydrology Presen	_{t?} Yes 💿 No	\circ	within a Wetland?	100 - 110		
Remarks:			•			
	n ROW. The wetland is as	ssociated with a seaso	ata point is located in a shonal groundwater discharge			
Hydrology						
Wetland Hydrology Indica	tors:			Secondary Ir	ndicators (minimum	of two required)
Primary Indicators (minim	ium of one required; chec	ck all that apply)		Surface 9	Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plants (B	14)	Sparsely	Vegetated Concave	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide Odor	(C1)	Drainage	Patterns (B10)	
Saturation (A3)		Oxidized Rhizospheres	along Living Roots (C3)	Moss Tri	m Lines (B16)	
Water Marks (B1)		Presence of Reduced I	ron (C4)	Dry Seas	on Water Table (C2))
Sediment Deposits (B2)		Recent Iron Reduction	in Tilled Soils (C6)	Crayfish	Burrows (C8)	
Drift deposits (B3)		Thin Muck Surface (C7)	Saturatio	n Visible on Aerial Ir	magery (C9)
Algal Mat or Crust (B4)		Other (Explain in Rema	arks)	Stunted	or Stressed Plants (D	01)
Iron Deposits (B5)				Geomorp	ohic Position (D2)	
Inundation Visible on Aer	• , , ,			Shallow /	Aquitard (D3)	
Water-Stained Leaves (B9	9)				ographic Relief (D4)	
Aquatic Fauna (B13)				✓ FAC-neut	tral Test (D5)	
Field Observations:	Yes ● No ○	Donth (inches)	0.5			
Surface Water Present?		Depth (inches):	0.5			
Water Table Present?	Yes ○ No •	Depth (inches):	Wetland Hyd	drology Presei	nt? Yes •	No O
Saturation Present? (includes capillary fringe)	Yes No	Depth (inches):	0	irology Fresei	100	110 0
Describe Recorded Data (s	tream gauge, monitoring	well, aerial photos, p	revious inspections), if ava	ilable:		
Remarks:						
The region is experiencing	yon, dry and drought lik	o conditions				
The region is experiencing	very dry and drought lik	e conditions.				

		—Species? —		Sampling Point: INC-W-004 (PEM)
	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover		Status	
4	0	0.0%		Number of Dominant Species
1				That are OBL, FACW, or FAC: 4 (A)
2	0	0.0%		Total Number of Dominant
3	0	0.0%		Species Across All Strata: 4 (B)
	_	0.0%		
4				Percent of dominant Species
5	0	0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
6	0	0.0%		That Aic obe, TACW, of TAC.
7	_	0.0%		Prevalence Index worksheet:
		0.0%		Total % Cover of: Multiply by:
8				
Sapling-Sapling/Shrub Stratum (Plot size:	0	= Total Cover		OBL species $20 \times 1 = 20$
Sapling-Sapling/Snrub Stratum (1 lot 3126.				FACW species
1	0			
2	0	0.0%		<u> </u>
3	0	0.0%		FACU species $0 \times 4 = 0$
				UPL species $0 \times 5 = 0$
4	0	0.0%		·
5	0	0.0%		Column Totals: <u>100</u> (A) <u>210</u> (B)
6.		0.0%		Prevalence Index = $B/A = 2.100$
		0.0%		Trevalence index = b/rt =
7				Hydrophytic Vegetation Indicators:
8	0			Rapid Test for Hydrophytic Vegetation
9	0	0.0%		Dominance Test is > 50%
10		0.0%		I =
10				Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)	0	= Total Cover		Morphological Adaptations ¹ (Provide supporting
1	0	0.0%		data in Remarks or on a separate sheet)
		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2				
3	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:
		0.0%		Four Vegetation Strata:
6				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), regardless
Herb Stratum (Plot size: 10 feet)		= Total Cover		of height.
				Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	30	30.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Juncus effusus	20	✓ 20.0%	FACW	Herb stratum - Consists of all herbaceous (non-woody) plants,
3. Pilea pumila	10	10.0%	FACW	regardless of size, and all other plants less than 3.28 ft tall.
	20	20.0%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft
4. Impatiens capensis				in height.
5. Scirpus atrovirens	20	20.0%	OBL	
6	0	0.0%		Five Vegetation Strata:
7		0.0%		Five vegetation strata.
				Tree - Woody plants, excluding woody vines, approximately 20
8	0			ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9	0	0.0%		l
10		0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than
	0	0.0%		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:)	100	= 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 m)
2	0	0.0%		in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
	0	0.0%		height.
4				
5				Hydrophytic
6	0	0.0%		Vegetation
	0	= Total Cover		Present? Yes No
Remarks: (Include photo numbers here or on a separate she	et.)			

Soil Sampling Point: INC-W-004 (PEM)

Profile Descri	iption: (Describe to	the depth n	eeded to document	the indic	ator or co	nfirm the a	absence of indicators.)			
Depth	Matrix			dox Featu						
(inches)	Color (moist)	<u> </u>	Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks		
0-20	2.5Y 5/1	90	5YR 5/6	10	C	M	Silt Loam			
			-							
			· <u>-</u>				-			
¹ Type: C=Cond	centration. D=Depletio	n. RM=Reduc	ed Matrix, CS=Cover	ed or Coate	d Sand Gra	ins ² Locat	tion: PL=Pore Lining. M=M	atrix		
Hydric Soil I			*				Indicators for Proble			
Histosol (A			Dark Surface (S7)						
	pedon (A2)		Polyvalue Belo	,	S8) (MLRA	147,148)	2 cm Muck (A10)			
☐ Black Histi			Thin Dark Surf	•	, .		Coast Prairie Redo	ox (A16)		
	Sulfide (A4)		Loamy Gleyed			,	(MLRA 147,148)			
	Layers (A5)		Depleted Matri				Piedmont Floodpl (MLRA 136, 147)	ain Soils (F19)		
	k (A10) (LRR N)		✓ Redox Dark Su				Very Shallow Dark	(Surface (TF12)		
	Below Dark Surface (A	11)	Depleted Dark		7)		Other (Explain in			
	k Surface (A12)	/	Redox Depress					remarks)		
Sandy Mu	ck Mineral (S1) (LRR N	l,	☐ Iron-Manganes	se Masses (F12) (LRR I	N,				
MLRA 147			MLRA 136) Umbric Surface	, (E13) (MI	DA 136 13	2)				
	eyed Matrix (S4)						³ Indicators of	hydrophytic vegetation and		
Sandy Red			☐ Piedmont Floo				wetland hydrology must be present,			
Stripped N	Matrix (S6)		Red Parent Ma	teriai (F21)	(MLKA 12)	/, 14/)	uniess di	sturbed or problematic.		
Restrictive La	ayer (if observed):									
Туре:							Undia Call Danas and	v		
Depth (inch	nes):						Hydric Soil Present?	Yes No		
Remarks:										

Project/Site: Indiantown Ga	p National Cemetery Exp	ansion Project	City/County:	East Hanover, Le	ebanon C	O. Sampling	Date: 07-0	ct-20	
Applicant/Owner: Mabbett 8	& Associates, Inc.			State: PA		Sampling Point:	INC-W-	·004 (U	PL)
Investigator(s): Bridger The	ompson		Section, Town	nship, Range: S		т	R		
Landform (hillslope, terrace,	etc.): Hillside		Local relief (co	ncave, convex, n	none):	convex Slo	pe: 8.7	% /	5.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.:	40.42419661	Lon	1a.: -76	5.56575307	Datum:		
Soil Map Unit Name: CmB-					_	WI classification: N	/A		
Are climatic/hydrologic cond			ar? Yes	No 🍑 (If no.	. explair	n in Remarks.)			
Are Vegetation, Soi		_	y disturbed?		•	stances" present?	Yes	No O	
						·			
Are Vegetation	_ , ,	. –	roblematic? ampling po		-	any answers in Rema	-	ures, e	etc.
Hydrophytic Vegetation Pre	esent? Yes O	- <u> </u>				<u> </u>		-	
Hydric Soil Present?		lo 💿	Is the	Sampled Area					
Wetland Hydrology Present	yes O	lo 💿		a Wetland?	Yes C	No ●			
Remarks:									
Upland data point collected boundary.	d to verify the wetland	l boundary. The data	point is locate	d in a in a wood	led/shru	ıbby area adjacent to	the wetlan	d	
Hydrology									
Wetland Hydrology Indicat	ors:				Second	lary Indicators (minimum	n of two requ	ired)	
Primary Indicators (minimu	um of one required; cl				Sur	face Soil Cracks (B6)			
Surface Water (A1)		True Aquatic Plants	(B14)		Spa	arsely Vegetated Concav	e Surface (B8	3)	
High Water Table (A2)		Hydrogen Sulfide O	dor (C1)		Dra	ainage Patterns (B10)			
Saturation (A3)		Oxidized Rhizosphe	res along Living F	Roots (C3)	Mo	ss Trim Lines (B16)			
Water Marks (B1)		Presence of Reduce	ed Iron (C4)		Dry	Season Water Table (C	2)		
Sediment Deposits (B2)		Recent Iron Reduct	tion in Tilled Soils	(C6)	Cra	yfish Burrows (C8)			
Drift deposits (B3)		☐ Thin Muck Surface	(C7)		Sat	curation Visible on Aerial	Imagery (C9)	
☐ Algal Mat or Crust (B4)		Other (Explain in Re	emarks)		Stu	inted or Stressed Plants	(D1)		
☐ Iron Deposits (B5)					Geo	omorphic Position (D2)			
Inundation Visible on Aeria	al Imagery (B7)				Sha	allow Aquitard (D3)			
Water-Stained Leaves (B9))				Mic	crotopographic Relief (D4	1)		
Aquatic Fauna (B13)					FAC	C-neutral Test (D5)			
Field Observations:	Yes O No •	Double (in alcos)							
Surface Water Present?		Depth (inches):							
Water Table Present?	Yes ○ No ●	Depth (inches):		Wetland Hydr	rology B	Present? Yes	No 💿		
Saturation Present? (includes capillary fringe)	Yes O No 💿	Depth (inches):		Wedana riyar	lology r	resent: 105 g	110		
Describe Recorded Data (st	tream gauge, monitori	ng well, aerial photo	s, previous insp	ections), if avail	lable:				
Remarks:									
The region is experiencing	very dry and drought	like conditions.							

			ninant		Sampling Point: <u>INC-W-004 (UPL)</u>
	Absolute % Cover	Rel.		Indicator Status	Dominance Test worksheet:
1 . Juglans nigra	20	_ _	50.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:(A)
2. Carya ovata	20	_ _	50.0%	FACU	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:)	40	= Tot	al Cover		OBL species 0 x 1 = 0 FACW species 0 x 2 = 0
1			0.0%		
2			0.0%		FAC species $\underline{60}$ x 3 = $\underline{180}$
3	0_		0.0%		FACU species $50 \times 4 = 200$
4	0_		0.0%		UPL species $\frac{20}{}$ x 5 = $\frac{100}{}$
5	0_		0.0%		Column Totals: <u>130</u> (A) <u>480</u> (B)
6	_		0.0%		Prevalence Index = B/A = 3.692
7	0		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: _15 feet)	_	= Tot	al Cover		
4. Dodou bounds	20	✓	33.3%	FAC	Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
0 - 1 - 1 - 1	10		16.7%	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
0.51.11	10	П-	16.7%	FAC	¹ Indicators of hydric soil and wetland hydrology must
4 = 4 4 4 4		<u> </u>	33.3%	UPL	be present, unless disturbed or problematic.
			0.0%	012	Definition of Vegetation Strata:
5		<u> </u>	0.0%		Four Vegetation Strata:
6	0		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7			al Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Herb Stratum (Plot size: 10 feet)					Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	30		100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0	Ц_	0.0%		Herb stratum – Consists of all herbaceous (non-woody) plants,
3	0	Ц_	0.0%		regardless of size, and all other plants less than 3.28 ft tall.
4	0	Ц_	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5	0	Ц_	0.0%		
6	0	닖_	0.0%		Five Vegetation Strata:
7		닖_	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 diameter at breast height (DBH).
9	0	님_	0.0%		Sapling stratum – Consists of woody plants, excluding woody
10		Ц_	0.0%		vines, approximately 20 ft (6 m) or more in height and less than
11	0	Ц_	0.0%		3 in. (7.6 cm) DBH.
12		\sqcup _	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:)	30	= Tot	al Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
1			0.0%		including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m)
2		<u> </u>	0.0%		in height.
3		<u> </u>	0.0%		Woody vines – Consists of all woody vines, regardless of height.
4		Ц_	0.0%		
5	0	Ц_	0.0%		Hydrophytic
6	0	\sqcup _	0.0%		Vegetation Present? Yes ○ No ●
	0	= Tot	tal Cover	·	rieseliti 100 0 110 0
Remarks: (Include photo numbers here or on a separate shee	et.)	_			

Soil Sampling Point: INC-W-004 (UPL)

Profile Descr		the depth				nfirm the a	absence of indicators.)	
Depth	Matrix			lox Featu	ires 1			
(inches) 0-12	Color (moist)	100	Color (moist)	%_	Tvpe 1	Loc ²	Texture	Remarks
	2.5Y 4/4						Silt Loam	
12-20	2.5Y 5/4	100					Silty Clay	
							-	
	-							
¹ Type: C=Con	centration. D=Depletic	n. RM=Redi	uced Matrix, CS=Covere	ed or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I	Indicators:						Indicators for Broble	ematic Hydric Soils ³ :
Histosol (Dark Surface (57)				
= `	pedon (A2)		Polyvalue Belov		(S8) (MLRA	147,148)	2 cm Muck (A10)	(MLRA 147)
Black Hist			, Thin Dark Surfa				Coast Prairie Red	ox (A16)
	Sulfide (A4)		Loamy Gleyed			,	(MLRA 147,148)	
	Layers (A5)		Depleted Matrix				Piedmont Floodpl (MLRA 136, 147)	
	k (A10) (LRR N)		Redox Dark Su				Very Shallow Dar	
	Below Dark Surface (A	.11)	Depleted Dark	Surface (F	7)		Other (Explain in	
	k Surface (A12)	,	Redox Depress					Remarks)
	ick Mineral (S1) (LRR N	١,	☐ Iron-Manganes	e Masses (F12) (LRR I	٧,		
MLRA 147	7, 148)	,	MLRA 136)					
Sandy Gle	eyed Matrix (S4)		Umbric Surface	(F13) (ML	-RA 136, 12	2)	3 7	hydrophytic vegetation and
Sandy Re	dox (S5)		☐ Piedmont Floor	dplain Soils	(F19) (MLF	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and drology must be present,
Stripped I	Matrix (S6)		Red Parent Ma	terial (F21)) (MLRA 127	7, 147)		sturbed or problematic.
Restrictive L	ayer (if observed):							
Type:	ayer (ii observea).							
Depth (incl							Hydric Soil Present?	Yes ○ No •
	1103/1							
Remarks:								
1								
1								

Project/Site: Indiantown G	ap National Cemetery Ex	pansion Project	City/County: East Hanov	ver, Lebanon Co.	Sampling Da	ate: 07-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.		State	e: PA	Sampling Point:	INC-W-005 (PEM)
Investigator(s): Bridger Th	nompson		Section, Township, Rang	je: S	т	R
Landform (hillslope, terrace	e, etc.): Hillside		Local relief (concave, conv	vex, none): CO	oncave Slope	8.7 %/ 5.0°
Subregion (LRR or MLRA):	MLRA 147 in LRR S		40.4240437	Long.: -76.56	 531849	Datum: NAD-83
Soil Map Unit Name: CmB			101.12.10.10.		classification: N/A	
Are climatic/hydrologic con	· · · · · · · · · · · · · · · · · · ·	<u> </u>	ear? Yes • No O (If no, explain in F		
Are Vegetation , So			`	•		′es ● No ○
_ ,				ormal Circumstan	ices present.	
Are Vegetation, So	oil 🔲 , or Hydrolo	ogy 🔲 naturally p	oroblematic? (If nee	ded, explain any	answers in Remark	s.)
Summary of Findin			sampling point loca	tions, transe	ects, importan	it features, etc.
Hydrophytic Vegetation Pr		No O				
Hydric Soil Present?	Yes	No O	Is the Sampled A		\circ	
Wetland Hydrology Preser	nt? Yes ●	No O	within a Wetland	, 100 - 110	, -	
Remarks:			<u>.</u>			
The wetland is associated chroma redox soils and the			thin a disturbed area of the	: ROW. The wetla	and boundary is def	ined by the low
Hydrology						
Wetland Hydrology Indica	tors:			_Secondary I	indicators (minimum o	f two required)
Primary Indicators (minin	num of one required;	check all that apply)		Surface	Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plant	rs (B14)	Sparsely	Vegetated Concave S	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide (• •		e Patterns (B10)	
Saturation (A3)			eres along Living Roots (C3)		im Lines (B16)	
Water Marks (B1)		Presence of Reduc	` '		son Water Table (C2)	
Sediment Deposits (B2)			ction in Tilled Soils (C6)		Burrows (C8)	
Drift deposits (B3)		☐ Thin Muck Surface	• •		on Visible on Aerial Im	,
Algal Mat or Crust (B4)		Other (Explain in F	Remarks)		or Stressed Plants (D:	1)
☐ Iron Deposits (B5)	rial Imagon, (P7)				phic Position (D2)	
☐ Inundation Visible on Ael ☐ Water-Stained Leaves (B	• , , ,				Aquitard (D3)	
Aquatic Fauna (B13)	9)				pographic Relief (D4) utral Test (D5)	
Field Observations:				▼ FAC-IIEU	itiai Test (D3)	
Surface Water Present?	Yes O No 💿	Depth (inches):				
Water Table Present?	Yes ○ No ●	Depth (inches):				
Saturation Present?				l Hydrology Prese	ent? Yes 💿	No O
(includes capillary fringe)	Yes No	Depth (inches):	0			
Describe Recorded Data (stream gauge, monito	ring well, aerial photo	os, previous inspections), if	f available:		
Domarka						
Remarks:		4 lil				
The region is experiencing	j very dry and drough	t like conditions.				

		—Species? —		Sampling Point: INC-W-005 (PEM)
	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover		Status	
4	0	0.0%		Number of Dominant Species
1				That are OBL, FACW, or FAC: (A)
2	0	0.0%		Total Number of Dominant
3	0	0.0%		Species Across All Strata: 2 (B)
	_	0.0%		
4				Percent of dominant Species
5	0			That Are OBL, FACW, or FAC: 100.0% (A/B)
6	0	0.0%		That Are ODL, FACW, OF FAC.
7	_	0.0%		Prevalence Index worksheet:
		0.0%		Total % Cover of: Multiply by:
8				
Sapling-Sapling/Shrub Stratum (Plot size:		= Total Cover		OBL species 0 x 1 = 0
Sapling-Sapling/Shrub Stratum (1 lot 312e.				FACW species
1	0	0.0%		
2	0	0.0%		<u> </u>
		0.0%		FACU species $0 \times 4 = 0$
3				UPL species $0 \times 5 = 0$
4	0			·
5	0	0.0%		Column Totals: 100 (A) 250 (B)
6.	0	0.0%		Prevalence Index = B/A = 2.500
		0.0%		Trevalence index = b/A =
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%		
10	_			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)
		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2				
3	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:
				Four Vegetation Strata:
6	0			1
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), regardless
Herb Stratum (Plot size: 10 feet)		= Total Cover		of height.
Herb Stratum (Flot size. 10 leet)				Sapling/shrub stratum – Consists of woody plants, excluding
1 Microstegium vimineum	50	✓ 50.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Onoclea sensibilis	40	✓ 40.0%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
Vernonia noveboracensis	10	10.0%	FACW	regardless of size, and all other plants less than 3.28 ft tall.
			TACT	Woody vines – Consists of all woody vines greater than 3.28 ft
4	0			in height.
5	0	0.0%		
6	0	0.0%		F. W
	0	0.0%		Five Vegetation Strata:
7				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 than 3 in. (7.6 cm) DBH.
11	0			` '
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
(District)	100	= Total Cover		1
Woody Vine Stratum (Plot size:)				Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
1	0	0.0%		species, except woody vines, less than approximately 3 ft (1 m)
2	0	0.0%		in height.
2		0.0%		Woody vines – Consists of all woody vines, regardless of
3				height.
4		0.0%		
5	0	0.0%		Hodoobark.
6.	0	0.0%		Hydrophytic Vegetation
U				Present? Yes No
	0	= Total Cover		
Remarks: (Include photo numbers here or on a separate shee	et.)	·		
(

Soil Sampling Point: INC-W-005 (PEM)

						nfirm the	absence of indicators.)	
Depth (inches)	Mat		Color (moist)	ledox Feati %	Tvpe 1	Loc2	Tourbure	Remarks
0-10	2.5Y 4/1	90	5YR 5/6		C	M	<u>Texture</u> Silt Loam	Remarks
10-20	2.5Y 5/2	90	5YR 5/6		C	M	Clay Loam	
	-							
¹ Type: C=Conc	centration. D=Den	letion. RM=Redu	ced Matrix, CS=Cove	ered or Coat	ed Sand Gra	ins ² l oca	tion: PL=Pore Lining. M=Ma	trix
Hydric Soil I		icuoni iti i – itcuu	ced Fidulix, e5=e6ve	crea or coat	ca Sana Gra	iii Loca		
Histosol (A			Dark Surface	(\$7)			Indicators for Problem	-
Histic Epip	,		Polyvalue Be	` '	(S8) (MLRA	147.148)	2 cm Muck (A10) (MLRA 147)
☐ Black Histi			☐ Thin Dark Su				Coast Prairie Redox	k (A16)
	Sulfide (A4)		Loamy Gleye			,	(MLRA 147,148)	Celle (510)
Stratified L	Layers (A5)		✓ Depleted Ma		,		Piedmont Floodpla (MLRA 136, 147)	In Solis (F19)
2 cm Muck	k (A10) (LRR N)		Redox Dark S	Surface (F6)			Very Shallow Dark	Surface (TF12)
Depleted E	Below Dark Surfac	e (A11)	Depleted Dar	k Surface (F	7)		Other (Explain in R	
☐ Thick Dark	k Surface (A12)		Redox Depre				_ ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	· · · · · ·
Sandy Muc MLRA 147	ck Mineral (S1) (Ll 7, 148)	RR N,	Iron-Mangan MLRA 136)	ese Masses	(F12) (LRR N	١,		
Sandy Gle	eyed Matrix (S4)		Umbric Surfa	ice (F13) (M	LRA 136, 12	2)	3	
☐ Sandy Rec	dox (S5)		Piedmont Flo	odplain Soils	s (F19) (MLR	A 148)	Indicators of h wetland hydr	ydrophytic vegetation and ology must be present,
Stripped M	Matrix (S6)		Red Parent N	1aterial (F21) (MLRA 127	, 147)		curbed or problematic.
Restrictive La	ayer (if observed	i):						
Type:								
Depth (inch	nes):						Hydric Soil Present?	Yes No
Remarks:								
Surface water	r infiltration is sl	ightly restricted	d by a shallow cla	y layer.				
			•					

Are Vegetation . , Soil . , or Hydrology . naturally problematic?	Long.: -76.56533848 Slope: 8.7 % / 5.0 ^ NWI classification: N/A N/A N/A
Landform (hillslope, terrace, etc.): Hillside Local relief (concave Subregion (LRR or MLRA): MLRA 147 in LRR S Lat.: 40.42399472 Soil Map Unit Name: CmB-Comly silt loam, 3 to 8 percent slopes Are climatic/hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation , Soil , or Hydrology significantly disturbed? Are Vegetation , Soil , or Hydrology naturally problematic?	p, Range: S T R re, convex, none): convex Slope: 8.7 % / 5.0 ° Long.: -76.56533848 NWI classification: N/A (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes No (If needed, explain any answers in Remarks.)
Sobregion (LRR or MLRA): MLRA 147 in LRR S Lat.: 40.42399472 Soil Map Unit Name: CmB-Comly silt loam, 3 to 8 percent slopes Are climatic/hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation , Soil , or Hydrology significantly disturbed? Are Vegetation , Soil , or Hydrology naturally problematic?	Long.: -76.56533848 Datum: NAD-83 NWI classification: N/A (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes No (If needed, explain any answers in Remarks.)
Subregion (LRR or MLRA): MLRA 147 in LRR S Lat.: 40.42399472 Soil Map Unit Name: CmB-Comly silt loam, 3 to 8 percent slopes Are climatic/hydrologic conditions on the site typical for this time of year? Yes No Care Vegetation , Soil , or Hydrology significantly disturbed? Are Vegetation , Soil , or Hydrology naturally problematic?	Long.: -76.56533848 Datum: NAD-83 NWI classification: N/A (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes No (If needed, explain any answers in Remarks.)
Are Vegetation , Soil , or Hydrology naturally problematic?	NWI classification: N/A (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes No (If needed, explain any answers in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are Vegetation , Soil , or Hydrology naturally problematic?	Are "Normal Circumstances" present? Yes No (If needed, explain any answers in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks.)
Are Vegetation $\ \square$, Soil $\ \square$, or Hydrology $\ \square$ naturally problematic?	(If needed, explain any answers in Remarks.)
Summary of Findings - Attach site man chowing campling point	locations, transects, important features, etc.
Summary of Findings - Actach site map showing sampling point	
Hydrophytic Vegetation Present? Yes ● No ○	
Hydric Soil Present? Yes O No • Is the Sam	ppled Area Yes O No •
Wetland Hydrology Present? Yes O No • within a W	etland?
Remarks:	
Upland data point collected to verify the wetland boundary. The data point is located in to the wetland boundary.	a iii a periodically maintained transmission line KOW adjacent
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one 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 along Living Roots	S (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):	
,	
Depart (meres).	/etland Hydrology Present? Yes ○ No ●
Saturation Present? (includes capillary fringe) Yes No Depth (inches):	reading Hydrology Fresche: Feb - Fres -
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection	ons), if available:
Remarks:	
The region is experiencing very dry and drought like conditions.	

Tree Stratum (Plot size:	Columb C	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	Indicator Status	Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC:
1	0	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		That are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B) Prevalence Index worksheet:
2	0	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		Total Number of Dominant Species Across All Strata: 3 (B) Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B) Prevalence Index worksheet:
3	0	0.0% 0.0% 0.0% 0.0% 0.0% Total Cover		Species Across All Strata:3(B) Percent of dominant Species That Are OBL, FACW, or FAC:66.7%(A/B) Prevalence Index worksheet:
4	0	0.0% 0.0% 0.0% 0.0% 0.0% Total Cover		Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B) Prevalence Index worksheet:
5	0 [0 0 [0 0] 0 0 =	0.0% 0.0% 0.0% 0.0% Total Cover		That Are OBL, FACW, or FAC: 66.7% (A/B) Prevalence Index worksheet:
6	0 [0 0 = 0 0 =	0.0% 0.0% 0.0% Total Cover		That Are OBL, FACW, or FAC: 66.7% (A/B) Prevalence Index worksheet:
7	0 [0 = 0 =	0.0% 0.0% Total Cover		
8	0 0 = 0 0 [0.0% Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)	0 =	Total Cover		Total 70 Cover of: Transply by:
Sapling-Sapling/Shrub Stratum (Plot size:) 1	0 [0 [OBL species 0 x 1 = 0
2	0 [FACW species $0 \times 2 = 0$
3		0.00/		
3	0			· ———
4		0.0%		10 TO
1.	0 [0.0%		UPL species $\frac{10}{}$ x 5 = $\frac{50}{}$
5	0 [0.0%		Column Totals: 80 (A) 270 (B)
6	0 [0.0%		Prevalence Index = $B/A = 3.375$
7	<u>o</u>			Hydrophytic Vegetation Indicators:
8	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: 15 feet)	0=	Total Cover		Morphological Adaptations ¹ (Provide supporting
	10 [1 00.0%	UPL	data in Remarks or on a separate sheet)
2	0 [0.0%		$oxedsymbol{\square}$ 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 [0.0%		Definition of Vegetation Strata:
6	0 [0.0%		Four Vegetation Strata:
7	0 [0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
	10 =	Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	30 [✓ 42.9%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding
, maragam viimaan		✓ 42.9% ✓ 42.9%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Z., 00th 10 parint	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.
U	0	0.0%	TACO	Woody vines – Consists of all woody vines greater than 3.28 ft
4	0 [0.0%		in height.
6	0	0.0%	-	
	0 [0.0%		Five Vegetation Strata:
7	0 [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).
9	0 [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.
2	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
-		Total 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
	0 [species, except woody vines, less than approximately 3 ft (1 m)
2	0 [in height.
3	0 [Woody vines – Consists of all woody vines, regardless of height.
4				· • •
J	<u> </u>			Hydrophytic
U	0	0.0%		Vegetation No. A. N. C.
	0 =	Total Cove	r	Present? Yes No C

Soil Sampling Point: INC-W-005 (UPL)

Depth	Matrix		Redox Features	_
(inches)	Color (moist)	<u>%</u>	Color (moist)%Tvpe_1Loc2_	Texture Remarks
0-12	2.5Y 4/4	100		Silt Loam
12-20	2.5Y 5/4	100		Clay Loam
ype: C=Conc	centration. D=Depletio	n. RM=Redu	ced Matrix, CS=Covered or Coated Sand Grains ² Loc	ation: PL=Pore Lining. M=Matrix
ydric Soil I				Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A	=		Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
 Histic Epip Black Histi			☐ Polyvalue Below Surface (S8) (MLRA 147,148) ☐ Thin Dark Surface (S9) (MLRA 147, 148)	Coast Prairie Redox (A16)
_	Sulfide (A4)		Loamy Gleyed Matrix (F2)	(MLRA 147,148)
_	Layers (A5)		Depleted Matrix (F3)	☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
2 cm Muck	(A10) (LRR N)		Redox Dark Surface (F6)	Very Shallow Dark Surface (TF12)
_ '	Below Dark Surface (A	11)	Depleted Dark Surface (F7)	Other (Explain in Remarks)
_	k Surface (A12)		Redox Depressions (F8)	
☐ Sandy Mud MLRA 147	ck Mineral (S1) (LRR N ', 148)	l,	☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
Sandy Gle	yed Matrix (S4)		Umbric Surface (F13) (MLRA 136, 122)	³ Indicators of hydrophytic vegetation and
Sandy Red			Piedmont Floodplain Soils (F19) (MLRA 148)	wetland hydrology must be present,
Stripped M	latrix (S6)		Red Parent Material (F21) (MLRA 127, 147)	unless disturbed or problematic.
	ayer (if observed):			
estrictive La				Hydric Soil Present? Yes No 🌘
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No •
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No •
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No •
estrictive La Type: Depth (inch				Hydric Soil Present? Yes No No
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No •
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
Restrictive La				Hydric Soil Present? Yes No No
Restrictive La Type: Depth (inch				Hydric Soil Present? Yes No No
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes ○ No ●
estrictive La Type: Depth (inch				Hydric Soil Present? Yes No No

Project/Site: Indiantown Ga	p National Cemetery Expansion I	Project City/Count	ty: East Hanover, Lebano	n Co. Sampling D	ate: 07-Oct-20
Applicant/Owner: Mabbett 8	& Associates, Inc.		State: PA	Sampling Point:	INC-W-006 (PEM)
Investigator(s): Bridger Tho	ompson	Section, T	ownship, Range: S	т	R
Landform (hillslope, terrace,	etc.): Gulch or Gully	Local relief	(concave, convex, none)	: concave Slop	e: <u>0.0</u> %/ _{0.0} °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	 Lat.: 40.425204	99 Long.:	-76.56015938	Datum: NAD-83
Soil Map Unit Name: BkD-B	Berks channery silt loam, 15			NWI classification: N/A	<u> </u>
Are climatic/hydrologic cond	litions on the site typical for	this time of year? Yes	left No $igcirc$ (If no, exp	lain in Remarks.)	
Are Vegetation $\ \ \ \ \ \ \ $, Soil	l 🗌 , or Hydrology 🗌	significantly disturbed	? Are "Normal Circ	umstances" present?	Yes No
Are Vegetation $\ \ \Box \ \ $, Soil	l 🗌 , or Hydrology 🗆	naturally problematic?	(If needed, expla	ain any answers in Remar	ks.)
Summary of Finding	s - Attach site map	showing sampling	point locations, t	ransects, importa	nt features, etc.
Hydrophytic Vegetation Pre					
Hydric Soil Present?	Yes ● No ○		the Sampled Area Yes	● No ○	
Wetland Hydrology Present	Yes • No O	wit	thin a Wetland?	C 110 C	
Remarks:					
wooded/shrubby lot. The v	ed to document the existing wetland is associated with th ows the saturated low chron	ne discharge of a seasonal	groundwater seep at th	ie headwater of a small in	
Hydrology					
Wetland Hydrology Indicate	ors:		Sec	ondary Indicators (minimum	of two required)
Primary Indicators (minimu	um of one required; check al	l that apply)		Surface Soil Cracks (B6)	
✓ Surface Water (A1)	Trı	ue Aquatic Plants (B14)		Sparsely Vegetated Concave	Surface (B8)
High Water Table (A2)	Hy-	drogen Sulfide Odor (C1)		Drainage Patterns (B10)	
Saturation (A3)	U Ox	idized Rhizospheres along Livi	ing Roots (C3)	Moss Trim Lines (B16)	
Water Marks (B1)	☐ Pre	esence of Reduced Iron (C4)		Dry Season Water Table (C2))
Sediment Deposits (B2)	L Re	cent Iron Reduction in Tilled S	Soils (C6)	Crayfish Burrows (C8)	
Drift deposits (B3)	Thi	in Muck Surface (C7)		Saturation Visible on Aerial I	magery (C9)
Algal Mat or Crust (B4)	Oth	her (Explain in Remarks)		Stunted or Stressed Plants (I	01)
☐ Iron Deposits (B5)				Geomorphic Position (D2)	
Inundation Visible on Aeria	• , , ,			Shallow Aquitard (D3)	
Water-Stained Leaves (B9))			Microtopographic Relief (D4)	
Aquatic Fauna (B13)			<u> </u>	FAC-neutral Test (D5)	
Field Observations: Surface Water Present?	Yes No	Depth (inches): 0.5			
	v	· · · · · ·	_		
Water Table Present? Saturation Present?	_	Depth (inches):		v Present? Yes •	No O
(includes capillary fringe)	Yes No D	Depth (inches): 0			
Describe Recorded Data (st	tream gauge, monitoring wel	II, aerial photos, previous	inspections), if available	:	
Remarks:					
	very dry and drought like co	anditions			
The region is experiencing	very dry and drought like co	HURUOIIS.			

		Dominant		Sampling Point: <u>INC-W-006 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 2 (B)
4.	_	0.0%		Species Across Air Strata.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: $\underline{100.0\%}$ (A/B)
6		0.0%		Duavalones Index weekshoots
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:)		= Total Cover		OBL species 30 x 1 = 30
1	_	0.0%		FACW species $20 \times 2 = 40$
2		0.0%		FAC species <u>40</u> x 3 = <u>120</u>
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
•••		0.0%		Column Totals: 90 (A) 190 (B)
5		0.0%		
6		0.0%		Prevalence Index = B/A = 2.111
7				Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	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:
		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), regardless
Herb Stratum (Plot size: 10 feet)		= Total Cover		of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Persicaria sagittata	30	✓ 33.3%	OBL	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Microstegium vimineum	30	✓ 33.3%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Setaria pumila	10	11.1%	FAC	regardless of size, and all other plants less than 3.28 ft tall.
4 Juncus effusus	10	11.1%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft
5 Mentha arvensis	10	11.1%	FACW	in height.
6	0	0.0%	-	Five Venetation Churchs
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).
		0.0%		Sapling stratum – Consists of woody plants, excluding woody
10				vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
11		0.0%		Shrub stratum – Consists of woody plants, excluding woody
12				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 species, except woody vines, less than approximately 3 ft (1 m)
2	0	0.0%		in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%	_	l
6.	0	0.0%		Hydrophytic Vegetation
J.,	0	= Total Cover	-	Present? Yes No
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-006 (PEM)

Profile Descr	iption: (De	escribe to	the depth	needed to	document	the indic	ator or co	nfirm the a	absence of indicators.)	
Depth		Matrix			Re	dox Featı				
(inches)		(moist)	%		(moist)	%_	Tvpe 1	Loc ²	Texture	Remarks
0-16	7.5YR	4/1	90	5YR	5/8	10	C	M	Silt Loam	
16-20	7.5YR	5/2	90	5YR	5/8		C	M	Clay Loam	
	-			-	_					
									-	
							_			
1 Type: C=Cond	centration.	 D=Depletio	on. RM=Red	uced Matrix,	CS=Cover	ed or Coate	ed Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I	indicators:									ematic Hydric Soils ³ :
Histosol (•				k Surface (•	(20) (11) 2.1		2 cm Muck (A10)	(MLRA 147)
☐ Histic Epip	pedon (A2) tic (A3)						(S8) (MLRA /ILRA 147, 1		Coast Prairie Red (MLRA 147,148)	ox (A16)
	Sulfide (A4 Layers (A5)				my Gleyed leted Matri)		Piedmont Floodpl (MLRA 136, 147)	ain Soils (F19)
	k (A10) (LR			Red	ox Dark Su	rface (F6)			Very Shallow Dar	
	Below Dark		11)		leted Dark ox Depress		7)		Other (Explain in	Remarks)
Sandy Mu	k Surface (<i>F</i> ick Mineral (•	٧,	☐ Iror	- n-Manganes	. ,	(F12) (LRR	N,		
MLRA 147	7, 148) eyed Matrix	(S4)			RA 136) bric Surface	e (F13) (MI	LRA 136, 12	22)		
Sandy Red		(- ')		Pied	lmont Floo	dplain Soils	s (F19) (ML	RA 148)	³ Indicators of wetland hy	hydrophytic vegetation and drology must be present,
Stripped N	Matrix (S6)			Rec	Parent Ma	iterial (F21) (MLRA 12	7, 147)		sturbed or problematic.
Restrictive La		-								
Type: Depth (incl									Hydric Soil Present?	Yes No
Remarks:										
Remarks.										

Project/Site: Indiantown Ga	p National Cemetery Expansion Pro	ject City/County:	East Hanover, Lebanor	Co. Samplin	g Date: 07-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.		State: PA	Sampling Poin	t: INC-W-006 (UPL)
Investigator(s): Bridger Th	ompson	Section, Tow	nship, Range: S	т	R
Landform (hillslope, terrace,	etc.): Hillside	Local relief (co	ncave, convex, none)	: convex S	lope:7.0 % /4.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.: 40.42525837	Long.:	40.42525837	Datum: NAD-83
Soil Map Unit Name: BkD-l	Berks channery silt loam, 15 to			NWI classification:	N/A
	litions on the site typical for thi		No 🏵 (If no. expl	ain in Remarks.)	
Are Vegetation, Soi		significantly disturbed?	. , .	umstances" present?	Yes ● No ○
Are Vegetation . , So		naturally problematic?		in any answers in Rer	
Summary of Finding	gs - Attach site map sh	owing sampling po		•	•
Hydrophytic Vegetation Pro	esent? Yes O No •				
Hydric Soil Present?	Yes 🔾 No 💿	Is the	Sampled Area	○ No ●	
Wetland Hydrology Present	_{t?} Yes O No 💿	within	a Wetland?		
Remarks:		•			
Hydrology					
Wetland Hydrology Indicat	:ors: um of one required; check all th	nat annly)		ondary Indicators (minim	um of two required)
Surface Water (A1)		Aquatic Plants (B14)		Surface Soil Cracks (B6) Sparsely Vegetated Conc	ave Surface (RR)
High Water Table (A2)		gen Sulfide Odor (C1)		Sparsely vegetated Conc Drainage Patterns (B10)	ave surface (bo)
Saturation (A3)	_ ′	ed Rhizospheres along Living		Moss Trim Lines (B16)	
Water Marks (B1)		nce of Reduced Iron (C4)		Dry Season Water Table	(C2)
Sediment Deposits (B2)		t Iron Reduction in Tilled Soils		Crayfish Burrows (C8)	(-)
Drift deposits (B3)		Nuck Surface (C7)		Saturation Visible on Aer	al Imagery (C9)
Algal Mat or Crust (B4)		(Explain in Remarks)		Stunted or Stressed Plan	• , , ,
Iron Deposits (B5)	_	(=		Geomorphic Position (D2)
Inundation Visible on Aeri	al Imagery (B7)			Shallow Aquitard (D3)	•
☐ Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)				FAC-neutral Test (D5)	
Field Observations:	0 0				
Surface Water Present?	·	th (inches):			
Water Table Present?	Yes O No O Dept	th (inches):	Matiana Unduales	y Present? Yes	○ No ●
Saturation Present? (includes capillary fringe)	Yes O No O Dept	th (inches):	Wetland Hydrology	y Present?) NO (S
	tream gauge, monitoring well, a	aerial photos, previous insp	pections), if available:		
Remarks:					
	very dry and drought like cond	itions.			
	, ,				

Tree Stratum	rer [Rel		FACU	Number of Dominant Species That are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: 5 (B)
1. Juglans nigra 20 2. 0 3. 0 4. 0 5. 0 6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size:) 1. 0			100.0% 0.0% 0.0% 0.0% 0.0% 0.0%		That are OBL, FACW, or FAC: (A) Total Number of Dominant Species Across All Strata: 5 (B)
2. 0 3. 0 4. 0 5. 0 6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size:) 1. 0			0.0% 0.0% 0.0% 0.0%	FACU	Total Number of Dominant Species Across All Strata:
3.	_ [_ [_ [_ [_ [0.0% 0.0% 0.0% 0.0%		Species Across All Strata:5(B)
4	_ [_ [_ [_ [_ [0.0% 0.0% 0.0%		Species Across All Strata:5(B)
5.	_ [_ [_ [_ [0.0%		Descent of descinant Constant
5. 0 6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size:) 1. 0	- [- [- [- =]_]_ 	0.0%		Dougant of douglasts Consider
6. 0 7. 0 8. 0 Sapling-Sapling/Shrub Stratum (Plot size:) 1. 0	- [- [- =]]]]			Percent of dominant Species
7	_ [_ [_ =]]	0.0%		That Are OBL, FACW, or FAC: 40.0% (A/B)
8	_ _ =	\Box^{-}			Prevalence Index worksheet:
Sapling-Sapling/Shrub Stratum (Plot size:	_ =		0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:) 10	_	Tot	tal Cover		OBL species 0 x 1 = 0
					FACW species 0 x 2 = 0
2	_ [$\Box_{\underline{}}$	0.0%		
	_ [$\Box_{}$	0.0%		FAC species $\underline{60}$ x 3 = $\underline{180}$
3		\Box_{-}	0.0%		FACU species $30 \times 4 = 120$
4 0			0.0%		UPL species $\frac{20}{}$ x 5 = $\frac{100}{}$
5	_ [0.0%		Column Totals: <u>110</u> (A) <u>400</u> (B)
6. 0	_ [0.0%		Prevalence Index = B/A = 3.636
7		\neg	0.0%		<u> </u>
	 -	=-	0.0%		Hydrophytic Vegetation Indicators:
· -		Ξ-	0.0%		Rapid Test for Hydrophytic Vegetation
J.,		Ϊ-			☐ Dominance Test is > 50%
10	- L		0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)	_ =	Tot	tal Cover		Morphological Adaptations ¹ (Provide supporting
1. Rosa multiflora 10	_ [∠ _	25.0%	FACU	data in Remarks or on a separate sheet)
2. Elaeagnus umbellata 20	_ [/	50.0%	UPL	☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3. Lindera benzoin 10	_ [~	25.0%	FAC	¹ Indicators of hydric soil and wetland hydrology must
40	_ [╗¯	0.0%		be present, unless disturbed or problematic.
50	_ 	\neg	0.0%		Definition of Vegetation Strata:
			0.0%		Four Vegetation Strata:
·	– L	Π-			Tree stratum – Consists of woody plants, excluding vines, 3 in.
7			0.0%		(7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet) 40	_ =	101	tal Cover		of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum 50	_ [✓_	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	_ [$\Box_{\underline{\ }}$	0.0%		Herb stratum – Consists of all herbaceous (non-woody) plants,
3	_ [0.0%		regardless of size, and all other plants less than 3.28 ft tall.
40			0.0%		Woody vines - Consists of all woody vines greater than 3.28 ft
50			0.0%	-	in height.
60	_ [0.0%		Fine Wandaline Churcher
7	_ [٦	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
0	– '	Ξ-	0.0%		diameter at breast height (DBH).
J	-	Ϊ-			Sapling stratum – Consists of woody plants, excluding woody
00		Η-	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
11	- L	Η-	0.0%		Shrub stratum – Consists of woody plants, excluding woody
12	_ L	ᆜ_	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	_ =	To	tal Cover		Herb stratum – Consists of all herbaceous (non-woody) plants,
10	_ [0.0%		including herbaceous vines, regardless of size, and woody
20		╗¯	0.0%		species, except woody vines, less than approximately 3 ft (1 m) in height.
3	 	$\bar{\neg}$	0.0%		Woody vines – Consists of all woody vines, regardless of
		Ξ-	0.0%		height.
т					
J	_ L	۲-	0.0%		Hydrophytic
6	_ L	<u> </u>	0.0%		Vegetation Present? Yes ○ No ●
0	_=	То	tal Cover	•	

Soil Sampling Point: INC-W-006 (UPL)

						nfirm the a	absence of indicators.)		
Depth	Matı			ox Featur		12		Danie de	
(inches) 0-16	Color (moist	t) <u>%</u> 100	Color (moist)	<u></u> %	Type 1	Loc2	<u>Texture</u> Silt Loam	Remarks	
-									
16-20	7.5YR 5/3						Clay Loam		
		-							
				-			-		
				-					
¹ Type: C=Cond	centration. D=Dep	letion. RM=Redu	ced Matrix, CS=Covere	d or Coated	Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=Matrix	1	
Hydric Soil I			•				Indicators for Problema		
Histosol (A			☐ Dark Surface (S	7)				•	
`	pedon (A2)		Polyvalue Below		8) (MLRA	147,148)	2 cm Muck (A10) (ML	RA 147)	
☐ Black Histi			☐ Thin Dark Surfa				Coast Prairie Redox (A	\16)	
	Sulfide (A4)		Loamy Gleyed N		,	-,	(MLRA 147,148)		
	Layers (A5)		Depleted Matrix				Piedmont Floodplain 9 (MLRA 136, 147)	Soils (F19)	
	(A10) (LRR N)		Redox Dark Sur				Very Shallow Dark Su	rfaco (TE12)	
	Below Dark Surfac	e (Δ11)	Depleted Dark S	. ,)				
	k Surface (A12)	c (AII)	Redox Depression		•		Uther (Explain in Remarks)		
	ck Mineral (S1) (LF	RR N	☐ Iron-Manganese		12) (LRR	N,			
MLRA 147	', 148)	KIC IV,	MLRA 136)	`	, (•			
Sandy Gle	Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122)								
Sandy Red			Piedmont Flood	plain Soils ((F19) (ML	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
Stripped M			Red Parent Mat	erial (F21)	(MLRA 12	7, 147)			
	ayer (if observed	i):							
Type:							Hydric Soil Present?	ſes ○ No •	
Depth (inch	nes):						Tryunc 3011 Present:		
Remarks:									

Project/Site: Indiantown Gap National Cemetery Expansion Project	City/County: East Hanover, Lebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Associates, Inc.	State: PA Sampling Point: INC-W-007 (PEM)
Investigator(s): Bridger Thompson	Section, Township, Range: S T R
Landform (hillslope, terrace, etc.): Gulch or Gully	Local relief (concave, convex, none): concave Slope: 5.2 % / 3.0 °
Subregion (LRR or MLRA): MLRA 147 in LRR S	Lat.: 40.42042552 Long.: -76.55724517 Datum: NAD-83
Soil Map Unit Name: WeD-Weikert channery silt loam, 15 to 25	
Are climatic/hydrologic conditions on the site typical for this time	e of year? Yes O No 🏵 (If no, explain in Remarks.)
Are Vegetation $\ \square$, Soil $\ \square$, or Hydrology $\ \square$ signi	ficantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation 🔲 , Soil 🗌 , or Hydrology 🔲 natu	rally problematic? (If needed, explain any answers in Remarks.)
Summary of Findings - Attach site map showi	ng sampling point locations, 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?
Remarks:	
	ons. The data point is located in a slight depression within a natural gully that contains boundary is defined by the saturated soil conditions and the vegetation containging
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one required; check all that ag	Oply) Surface Soil Cracks (B6)
Surface Water (A1)	c Plants (B14) Sparsely Vegetated Concave Surface (B8)
l <u> </u>	ulfide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rh	izospheres along Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of	Reduced Iron (C4) Dry Season Water Table (C2)
Sediment Deposits (B2)	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift deposits (B3)	Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	ain 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 (inc	de a N
	nes):
Water Table Present? Yes No Depth (inc	ches): Wetland Hydrology Present? Yes No
Saturation Present? (includes capillary fringe) Yes No Depth (inc	
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspections), if available:
Remarks:	
The region is experiencing very dry and drought like conditions	

		Dominant		Sampling Point: <u>INC-W-007 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:3 (A)
2	0	0.0%		
3		0.0%		Total Number of Dominant Species Across All Strata: 3 (B)
4		0.0%		Species Across Air Strata.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: $\underline{100.0\%}$ (A/B)
6		0.0%		Dravalonae Index weekshooti
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:		= Total Cover		OBL species $40 \times 1 = 40$
1	_	0.0%		FACW species $30 \times 2 = 60$
2		0.0%		FAC species 30 x 3 = 90
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
5		0.0%		Column Totals: 100 (A) 190 (B)
6		0.0%		Dravalance Index D/A 1 000
7		0.0%		Prevalence Index = B/A = 1.900
		0.0%		Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	_	0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)		= Total Cover		$igcap$ 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	0.0%		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: 10 feet)		_		Sapling/shrub stratum – Consists of woody plants, excluding
1. Persicaria sagittata		20.0%	OBL	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Scirpus atrovirens		20.0%	OBL	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Microstegium vimineum	30	30.0%	FAC	regardless of size, and all other plants less than 3.28 ft tall.
4. Onoclea sensibilis	10	10.0%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5 Impatiens capensis	10	10.0%	FACW	in noight
6. Persicaria pensylvanica	10	10.0%	FACW	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).
10.		0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than
11	0	0.0%		3 in. (7.6 cm) DBH.
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
		= Total 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			species, except woody vines, less than approximately 3 ft (1 m)
2	0	0.0%		in height.
3		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%		Vegetation
	0	= Total Cove	•	Present? Yes No
Remarks: (Include photo numbers here or on a separate shee				<u> </u>
Remarks: (Include photo numbers here or on a separate shee	t.)			

Soil Sampling Point: INC-W-007 (PEM)

Profile Descr	iption: (De		the depth	needed to				nfirm the a	absence of indicators.)		
Depth		Matrix				dox Featu	ires 1				
(inches)		(moist)		Color	(moist)	%	Type 1	Loc ²	Texture	Remarks	
0-4	2.5Y	4/2		-					Silt Loam		
4-12	2.5Y	5/1	_ 90	5YR	5/6	10	C	M	Silty Clay		
12-20	2.5Y	5/4	80	5YR	5/6	20	С	М	Clay Loam		
				-							
				-							
				-							
				-							
1											
			on. RM=Red	uced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=M	atrix	
Hydric Soil I		1							Indicators for Proble	ematic Hydric Soils ³ :	
Histosol (•				k Surface ((CO) (MI DA	1.47.1.40)	2 cm Muck (A10)	(MLRA 147)	
Black Hist	pedon (A2)						(S8) (MLRA 1LRA 147, 1		Coast Prairie Redo	ox (A16)	
	Sulfide (A4	`		_				140)	(MLRA 147,148)		
	Layers (A5)				my Gleyed)		Piedmont Floodpl	ain Soils (F19)	
	k (A10) (LR			✓ Depleted Matrix (F3) Redox Dark Surface (F6)					(MLRA 136, 147)		
	Below Dark		(11)		leted Dark	. ,	7)		☐ Very Shallow Dark Surface (TF12)		
	k Surface (A	•	111)	Redox Depressions (F8)					Other (Explain in	Remarks)	
	ck Mineral (,	٧,			se Masses (F12) (LRR	N,			
MLRA 147	7, 148)	(=-) (=	-,		RA 136)						
Sandy Gle	eyed Matrix	(S4)					-RA 136, 12		3 Indicators of	hydrophytic vegetation and	
Sandy Red				☐ Pied	dmont Floo	dplain Soils	(F19) (MLI	RA 148)	wetland hyd	rology must be present,	
Stripped N	Matrix (S6)			Rec	l Parent Ma	terial (F21)) (MLRA 12	7, 147)	unless di	sturbed or problematic.	
Restrictive La	ayer (if ob	served):									
Type:											
Depth (incl	hes):								Hydric Soil Present?	Yes ● No ○	
Remarks:											
Surface water	r infiltratio	n is slight	tly restricte	ed by a sha	allow clay	layer.					
		,	•	,	,	,					

Project/Site: Indiantown Ga	p National Cemetery Expa	ansion Project	City/County:	East Hanover, Leb	banon C	Co. Sampling D	ate: 08-00	:t-20
Applicant/Owner: Mabbett 8	& Associates, Inc.			State: PA		Sampling Point:	INC-W-	007 (UPL)
Investigator(s): Bridger Tho	ompson		Section, Town	nship, Range: S		т	_ R	
Landform (hillslope, terrace,	etc.): Gulch or Gull	ly I	Local relief (co	ncave, convex, n	one):	concave Slope	e: 5.2	%/ 3.0°
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.:	40.42048333	Lone	ig.: -7	6.55722319	Datum:	NAD-83
Soil Map Unit Name: BkD-B					_	WI classification: N/A	_	
Are climatic/hydrologic cond	itions on the site typic	cal for this time of year	ar? Yes 💿	No O (If no,	explai	n in Remarks.)		
Are Vegetation \Box , Soil	l , or Hydrolog	y Significantly	y disturbed?	Are "Normal	Circum	stances" present?	Yes 💿	No O
Are Vegetation, Soil	I , or Hydrolog		roblematic?			any answers in Remark	ks.)	
Summary of Finding	s - Attach site n	nap showing sa	ampling po		-	-	-	ıres, etc.
Hydrophytic Vegetation Pre	sent? Yes O N	lo •						
Hydric Soil Present?	Yes O N	lo 💿	Is the	Sampled Area	Voc (○ No ●		
Wetland Hydrology Present	_? Yes ON	lo 💿	within	a Wetland?	163	7 110 🕓		
Remarks:								
Hydrology								
Wetland Hydrology Indicate						dary Indicators (minimum	of two requi	red)
Primary Indicators (minimu	um of one required; cn		(34.4)			rface Soil Cracks (B6)	- (50	-
Surface Water (A1)	1	True Aquatic Plants				arsely Vegetated Concave	Surface (B8)
High Water Table (A2)	1	Hydrogen Sulfide O	• ,	. (63)		ainage Patterns (B10)		
Saturation (A3)	1	Oxidized Rhizosphe		Roots (C3)		oss Trim Lines (B16)		
Water Marks (B1)	l	Presence of Reduce	• •	(00)		y Season Water Table (C2))	
Sediment Deposits (B2) Drift deposits (B3)		Recent Iron Reducti		(C6)		ayfish Burrows (C8)	··(C0)	
Algal Mat or Crust (B4)	1	Thin Muck Surface (. ,			turation Visible on Aerial II		
Iron Deposits (B5)	ı	Other (Explain in Re	emarks)			unted or Stressed Plants (E omorphic Position (D2))1)	
Inundation Visible on Aeria	al Imagery (B7)					allow Aquitard (D3)		
Water-Stained Leaves (B9)						crotopographic Relief (D4)		
Aquatic Fauna (B13)	,					C-neutral Test (D5)		
Field Observations:						C Head at 1650 (25)		
Surface Water Present?	Yes ○ No •	Depth (inches):						
Water Table Present?	Yes O No 💿	Depth (inches):						
Saturation Present?	Yes O No •	Depth (inches):		Wetland Hydro	ology F	Present? Yes	No 💿	
(includes capillary fringe) Describe Recorded Data (st			s, previous insr	ections), if availa	able:			
20001100110001404 2444 (00	gaage,e	ng tron, donar priotos	o, p. o					
Remarks:								

		· ·			Sampling Point: <u>INC-W-007 (UPL)</u>
Tree Stratum (Plot size: <u>30 feet</u>)	Absolute % Cover	Re	ecies? - el.Strat. over	Indicator Status	Dominance Test worksheet:
1. Juglans nigra	30	V	100.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:
2	0	Ш	0.0%		Total Number of Dominant
3	0		0.0%		Species Across All Strata:3(B)
4			0.0%		
5			0.0%		Percent of dominant Species
6	_		0.0%		That Are OBL, FACW, or FAC: 33.3% (A/B)
7	0		0.0%		Prevalence Index worksheet:
8			0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:	20	= Tc	tal Cover	•	OBL species 0 x 1 = 0
	_		0.0%		FACW species $0 \times 2 = 0$
1			0.0%		FAC species $30 \times 3 = 90$
2					FACU species $30 \times 4 = 120$
3	-		0.0%		UPL species $50 \times 5 = 250$
4			0.0%		
5	0	Ц	0.0%		Column Totals: 110 (A) 460 (B)
6			0.0%		Prevalence Index = B/A = 4.182
7			0.0%		Hydrophytic Vegetation Indicators:
8	0_	Ц	0.0%		Rapid Test for Hydrophytic Vegetation
9	0_	Ш	0.0%		Dominance Test is > 50%
0	0		0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)	_	= To	tal Cover	r	Morphological Adaptations ¹ (Provide supporting
1. Elaeagnus umbellata	50	V	100.0%	UPL	data in Remarks or on a separate sheet)
2.		\Box	0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
			0.0%		¹ Indicators of hydric soil and wetland hydrology must
3			0.0%		be present, unless disturbed or problematic.
4 5			0.0%		Definition of Vegetation Strata:
			0.0%		Four Vegetation Strata:
6			0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
7					(7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	50	= 10	tal Cover	r	of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	30	✓	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0		0.0%		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		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0		0.0%		in height.
6	0		0.0%		Five Venetation Charte.
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
o			0.0%		diameter at breast height (DBH).
			0.0%		Sapling stratum – Consists of woody plants, excluding woody
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	0		0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	30	= 10	tal Cover	r	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 m)
2	0		0.0%		in height.
3	0		0.0%		Woody vines – Consists of all woody vines, regardless of
4	0		0.0%		height.
5			0.0%	-	
5 6.	0		0.0%		Hydrophytic Vegetation
U			otal Cove		Present? Yes No •
		= ''	DTAIL OVA		

Soil Sampling Point: INC-W-007 (UPL)

Profile Descr		the depth				nfirm the a	absence of indicators.)		
Depth	Matrix			dox Featı	ıres				
(inches)	Color (moist)		Color (moist)	%	Type 1	Loc²	<u>Texture</u>	Remarks	
0-6	10YR 4/4						Silt Loam		
6-20	10YR 5/4	90	5YR 5/6	10	C	M	Clay Loam		
				-					
						-			
¹ Type: C=Con	centration. D=Depleti	on. RM=Redu	uced Matrix, CS=Cover	ed or Coate	ed Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix	
Hydric Soil I	Indicators:						Indicators for Proble	ematic Hydric Soils ³ :	
Histosol (A1)		Dark Surface	(S7)			2 cm Muck (A10)	-	
Histic Epip	pedon (A2)		Polyvalue Belo	w Surface	(S8) (MLRA	147,148)			
Black Hist	tic (A3)		Thin Dark Surf	face (S9) (N	4LRA 147, 1	148)	Coast Prairie Redo (MLRA 147,148)	DX (A16)	
	Sulfide (A4)		Loamy Gleyed	Matrix (F2)		Piedmont Floodpl	ain Soils (F19)	
	Layers (A5)		Depleted Matr				(MLRA 136, 147)	,	
2 cm Muc	k (A10) (LRR N)		Redox Dark Si	` ,			☐ Very Shallow Dark Surface (TF12)		
	Below Dark Surface (A11)	Depleted Dark		7)		Other (Explain in Remarks)		
	k Surface (A12)		Redox Depres	. ,	(E40) (LBB				
Sandy Mu MLRA 147	ick Mineral (S1) (LRR 7, 148)	N,	Iron-Mangane MLRA 136)	se Masses	(F12) (LRR	N,			
Sandy Gle	eyed Matrix (S4)		Umbric Surfac	e (F13) (M	LRA 136, 12	22)	3		
Sandy Re	dox (S5)		Piedmont Floo	dplain Soils	s (F19) (MLI	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and Irology must be present,	
Stripped N	Matrix (S6)		Red Parent Ma	aterial (F21) (MLRA 12	7, 147)	unless disturbed or problematic.		
Restrictive L	ayer (if observed):								
Type:									
Depth (inc	hes):						Hydric Soil Present?	Yes O No 💿	
Remarks:									
Remarks.									

Project/Site: Indiantown Gap Natio	onal Cemetery Expansion Project	City/County: East Hanover, Le	ebanon Co. Sampling Date: 08-Oct-20		
Applicant/Owner: Mabbett & Association	ociates, Inc.	State: PA	Sampling Point: INC-W-008 (PEM)		
Investigator(s): Bridger Thompson	n	Section, Township, Range: S	TR		
Landform (hillslope, terrace, etc.):	Channel (active)	Local relief (concave, convex, r	none): concave Slope: 5.2 % / 3.0		
Subregion (LRR or MLRA): MLR	RA 147 in LRR S Lat.:	40.41976273 Lo i	ng.: -76.56112754		
	ert channery silt loam, 15 to 25 perce	ent slopes	NWI classification: N/A		
Are climatic/hydrologic conditions	s on the site typical for this time of ye	ear? Yes $lacktriangle$ No $lacktriangle$ (If no	, explain in Remarks.)		
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$, or Hydrology $\ \square$ significant	ly disturbed? Are "Norma	l Circumstances" present? Yes No		
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$, or Hydrology 🔲 naturally p	roblematic? (If needed,	explain any answers in Remarks.)		
Summary of Findings - A	<u> </u>	ampling point location	ns, transects, important features, etc.		
Hydrophytic Vegetation Present?					
Hydric Soil Present?	Yes 💿 No 🔾	Is the Sampled Area	Yes No		
Wetland Hydrology Present?	Yes 💿 No 🔾	within a Wetland?	100 - 110 -		
			allow depression along a small intermittent dary is defined by the saturated soil conditions and		
the low topography.					
Hydrology					
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)		
Primary Indicators (minimum of	one required; check all that apply)		Surface Soil Cracks (B6)		
✓ Surface Water (A1)	True Aquatic Plants	s (B14)	Sparsely Vegetated Concave Surface (B8)		
✓ High Water Table (A2)	Hydrogen Sulfide C	Odor (C1)	Drainage Patterns (B10)		
✓ Saturation (A3)	Saturation (A3) Oxidized Rhizospheres 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 Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in R	temarks)	Stunted or Stressed Plants (D1)		
Iron Deposits (B5)		•	Geomorphic Position (D2)		
Inundation Visible on Aerial Imag	gery (B7)		Shallow Aquitard (D3)		
☐ Water-Stained Leaves (B9)			Microtopographic Relief (D4)		
Aquatic Fauna (B13)			FAC-neutral Test (D5)		
Field Observations:					
Surface Water Present? Yes	, , ,	1			
Water Table Present? Yes	No Depth (inches):		rology Present? Yes No		
Saturation Present? (includes capillary fringe) Yes	No Depth (inches):	0 wetland Hyd	rology Present? Yes • No U		
	gauge, monitoring well, aerial photo	os, previous inspections), if avai	ilable:		
Remarks:					
	dur, and duringhe like armaising				
The region is experiencing very of	ary and drought like conditions.				

		Dominant		Sampling Point: <u>INC-W-008 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:4 (A)
2	0	0.0%		
3	0	0.0%		Total Number of Dominant Species Across All Strata: 4 (B)
4	_	0.0%		
5	0	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
6	0	0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
7	0			Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:	_)	= Total Cover	•	OBL species <u>20</u> x 1 = <u>20</u>
1	_	0.0%		FACW species $20 \times 2 = 40$
2	_	0.0%		FAC species 60 x 3 = 180
3	0	0.0%		FACU species $0 \times 4 = 0$
4	0	0.0%		UPL species $0 \times 5 = 0$
5	0	0.0%		Column Totals: 100 (A) 240 (B)
6	0	0.0%		Prevalence Index = $B/A = 2.400$
7		0.0%		Hydrophytic Vegetation Indicators:
8		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 feet)		= Total Cover		Morphological Adaptations ¹ (Provide supporting
1. Lindera benzoin	10	100.0%	FAC	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	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	10	= Total Cover	-	of height.
1. Microstegium vimineum	50	✓ 55.6%	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. Impatiens capensis	20	22.2%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Persicaria sagittata	20	22.2%	OBL	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
5	0	0.0%		in height.
6	0	0.0%		Five Vegetation Strata:
7	0	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	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 than
11				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:)	90	= 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 m)
2	0	0.0%		in height.
3				Woody vines – Consists of all woody vines, regardless of
4		0.0%		height.
5	0	0.0%		Hydrophytic
6	0	0.0%		Vegetation Var A Na O
	0	= Total Cove	r	Present? Yes VO
Remarks: (Include photo numbers here or on a separate sl	neet.)			

Soil Sampling Point: INC-W-008 (PEM)

Depth (inches) √ √ √ √ √ √ √ √ √ √ √ √ √ √ √ √ √ √ √
0-4 2.5Y 5/1 90 5YR 5/6 10 C M Silt Loam
4-20 N 5/1 90 5YR 5/6 10 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 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) ☐ ☐ 2 cm Muck (A10) (MLRA 147)
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148) Coast Prairie Redox (A16) (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) Iron Managanese Massac (F13) (LRR N
Sandy Muck Mineral (S1) (LRR N, MLRA 147, 148) Iron-Manganese Masses (F12) (LRR N, MLRA 136)
Sandy Gleyed Matrix (S4) Sandy Redox (S5) Umbric Surface (F13) (MLRA 136, 122) Piedmont Floodplain Soils (F19) (MLRA 148) Jandicators of hydrophytic vegetation and worthead by dealers a worth and by dealers are much be present.
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Piedmont Floodplain Soils (F19) (MLRA 148) wetland hydrology must be present, unless disturbed or problematic.
Restrictive Layer (if observed):
Type:
Depth (inches): Hydric Soil Present? Yes • No ·
Remarks:

Project/Site: Indiantown Gap National Cemetery Expansion Project	City/County: East Hanover, Lebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Associates, Inc.	State: PA Sampling Point: INC-W-008 (UPL)
Investigator(s): Bridger Thompson	Section, Township, Range: S T R
Landform (hillslope, terrace, etc.): Gulch or Gully	Local relief (concave, convex, none): Concave Slope: 7.0 % / 4.0 °
	t.: 40.41973822 Long.: -76.56124892 Datum: NAD-83
Soil Map Unit Name: BkD-Berks channery silt loam, 15 to 25 perce	
Are climatic/hydrologic conditions on the site typical for this time of	f year? Yes $ullet$ No $igcirc$ (If no, explain in Remarks.)
Are Vegetation $\ \square$, Soil $\ \square$, or Hydrology $\ \square$ significa	antly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation . , Soil . , or Hydrology . naturally	y problematic? (If needed, explain any answers in Remarks.)
	sampling point locations, 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?
Remarks: Upland data point collected to verify the wetland boundary. The d wetland boundary.	data point is located on a slight slope in a wooded/shrubby lot adjacent to the
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one required; check all that apply	/) Surface Soil Cracks (B6)
Surface Water (A1)	ants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide	de Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizos	spheres along Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Red	duced Iron (C4)
	duction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift deposits (B3) Thin Muck Surfa	ace (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in	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)	(3)
w u - v -	·
	Wetland Hydrology Present? Yes ○ No ●
Saturation Present? Yes No Depth (inches)	i):
Describe Recorded Data (stream gauge, monitoring well, aerial pho	otos, previous inspections), if available:
Remarks:	
ixemarks.	

		-Species? -		Sampling Point: INC-W-008 (UPL)
Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Rel.Strat.	Indicator Status	Dominance Test worksheet:
4.0	20	✓ 100.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
1. Carya glabra 2.		0.0%	_ TACO	That are OBL, FACW, or FAC: (A)
3		0.0%		Total Number of Dominant
		0.0%		Species Across All Strata:6(B)
4		0.0%		Percent of dominant Species
5		0.0%		That Are OBL, FACW, or FAC: 33.3% (A/B)
6		0.0%		Prevalence Index worksheet:
7		0.0%		Total % Cover of: Multiply by:
8		= Total Cove	-	OBL species 0 x 1 = 0
Sapling-Sapling/Shrub Stratum (Plot size:)	_		FACW species $0 \times 2 = 0$
1				FAC species $30 \times 3 = 90$
2	0			160
3		0.0%		
4		0.0%		ore species x y =
5		0.0%		Column Totals: $\underline{100}$ (A) $\underline{400}$ (B)
6				Prevalence Index = B/A = 4.000
7				Hydrophytic Vegetation Indicators:
8		0.0%		Rapid Test for Hydrophytic Vegetation
9		0.0%		Dominance Test is > 50%
10	0	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: _15 feet)	:	= Total Cove	r	Morphological Adaptations ¹ (Provide supporting
1. Rosa multiflora	10	✓ 16.7%	FACU	data in Remarks or on a separate sheet)
2. Rubus idaeus	10	✓ 16.7%	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
3. Cornus florida	10	✓ 16.7%	FACU	¹ Indicators of hydric soil and wetland hydrology must
4. Elaeagnus umbellata		50.0%	UPL	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: 10 feet)		= Total Cove	r	(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	20	✓ 100.0%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding
Microstegium vimineum 2.		0.0%	170	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
	0	0.0%		Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5		0.0%		in height.
6		0.0%		
		0.0%		Five Vegetation Strata:
7 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 1.	0	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
		= Total Cove	- — — r	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				species, except woody vines, less than approximately 3 ft (1 m)
2		0.0%		in height.
3				Woody vines – Consists of all woody vines, regardless of height.
4		0.0%		
5		0.0%		Hydrophytic
6		0.0%		Vegetation No. 0
	0	= Total Cove	r	Present? Yes O NO S
Remarks: (Include photo numbers here or on a separate	sheet.)			
·				

Soil Sampling Point: INC-W-008 (UPL)

Profile Descr	iption: (Describe to	the depth	needed to docume	ent the indi	cator or co	nfirm the	absence of indicators.)				
Depth	Matrix		Redox Features		Toyturo						
(inches)	Color (moist)		Color (moist)		Tvpe 1	Loc ²	Texture	Remarks			
0-10	10YR 4/4	_ 100					Silt Loam				
10-20	10YR 5/4	_ 90	5YR 5/6	10	_ <u>C</u>	M	Clay Loam				
	-						-				
							-				
							-				
¹ Type: C=Con	centration. D=Depletion	on. RM=Red	uced Matrix, CS=Cov	ered or Coat	ed Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix			
Hydric Soil 1	Indicators:						Indicators for Proble	ematic Hydric Soils ³ :			
Histosol (A1)		Dark Surface	e (S7)			2 cm Muck (A10)	(MI RA 147)			
Histic Epi	pedon (A2)		Polyvalue Be	low Surface	(S8) (MLRA	147,148)	Coast Prairie Red				
Black Hist			Thin Dark Su	ırface (S9) (I	MLRA 147, 1	L48)	(MLRA 147,148)	DX (A16)			
	Sulfide (A4)		Loamy Gleye		.)		Piedmont Floodpl	ain Soils (F19)			
	Layers (A5)		Depleted Ma				(MLRA 136, 147)				
	k (A10) (LRR N)		Redox Dark	` ,			Very Shallow Dark Surface (TF12)Other (Explain in Remarks)				
	Below Dark Surface (A	A11)	Depleted Da		-7)						
	k Surface (A12)		Redox Depre	, ,	(E13) (LDD	N.I.					
Sandy Mu MLRA 147	ick Mineral (S1) (LRR I 7, 148)	Ν,	Iron-Mangar MLRA 136)								
Sandy Gle	eyed Matrix (S4)		Umbric Surf	ace (F13) (M	LRA 136, 12	22)	3 - 11 - 6				
Sandy Re	dox (S5)		Piedmont Fl	oodplain Soil	s (F19) (MLI	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and drology must be present,			
Stripped I	Matrix (S6)		Red Parent	Material (F21	.) (MLRA 12	7, 147)		sturbed or problematic.			
Restrictive L	ayer (if observed):										
Туре:											
Depth (inc	hes):						Hydric Soil Present?	Yes O No 💿			
Remarks:											

Project/Site: Indiantown Ga	p National Cemetery Expansion Project	City/County: East Hanover,	Lebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett 8	& Associates, Inc.	State:	PA Sampling Point: INC-W-009 (PEM
Investigator(s): Bridger Tho	ompson	Section, Township, Range:	S TR
Landform (hillslope, terrace,	etc.): Swale	Local relief (concave, convex	x, none): concave Slope: 3.5 % / 2.0
Subregion (LRR or MLRA):	MLRA 147 in LRR S Lat	.: 40.41996921 L	.ong.: -76.56162197
Soil Map Unit Name: BkD-B	Berks channery silt loam, 15 to 25 perce		NWI classification: N/A
Are climatic/hydrologic cond	litions on the site typical for this time of	year? Yes \bigcirc No $lacktriangle$ (If r	no, explain in Remarks.)
Are Vegetation $\ \ \ \ \ \ \ $, Soil	l 🗌 , or Hydrology 🗌 significa	ntly disturbed? Are "Norm	nal Circumstances" present? Yes No
Are Vegetation $\ \ \ \ \ \ \ $, Soil	l 🗌 , or Hydrology 🗌 naturally	problematic? (If needed	d, explain any answers in Remarks.)
Summary of Finding		sampling point location	ons, transects, important features, etc
Hydrophytic Vegetation Pre			
Hydric Soil Present?	Yes No	Is the Sampled Area	Yes No
Wetland Hydrology Present	_? Yes 💿 No 🔾	within a Wetland?	165 G NG G
Remarks:		•	
			excevated swale that receives surface water runoff the topography of the swale and the saturated soil
Hydrology			
Wetland Hydrology Indicate	ors:		Secondary Indicators (minimum of two required)
Primary Indicators (minimu	um of one required; check all that apply		Surface Soil Cracks (B6)
✓ Surface Water (A1)	True Aquatic Pla	nts (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide	e Odor (C1)	Drainage Patterns (B10)
✓ Saturation (A3)	Oxidized Rhizosp	pheres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Red	uced Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Red	uction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	Thin Muck Surfa	ce (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in	n Remarks)	Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)			Geomorphic Position (D2)
Inundation Visible on Aeria	• , , ,		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)	: 0.5	
	· · · · ·		
Water Table Present? Saturation Present?	z opur (monos)	: Wetland Hv	ydrology Present? Yes No
(includes capillary fringe)	Yes No Depth (inches)		
Describe Recorded Data (st	ream gauge, monitoring well, aerial pho	tos, previous inspections), if av	vailable:
Remarks:			
	very dry and drought like conditions.		
The region is experiencing	very dry and drought like conditions.		

		Dominant		Sampling Point: <u>INC-W-009 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 2 (B)
4		0.0%		Species Across Air Strata.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
6		0.0%		Dravelan as Tuday weekshaats
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:	_) :	= Total Cover		OBL species $20 \times 1 = 20$
1	_	0.0%		FACW species $30 \times 2 = 60$
2		0.0%		FAC species $\underline{50}$ x 3 = $\underline{150}$
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
5		0.0%	-	Column Totals: 100 (A) 230 (B)
6		0.0%		Dravalance Index P/A 2 200
7		0.0%		Prevalence Index = B/A = 2.300
		0.0%		Hydrophytic Vegetation Indicators:
8		0.0%		Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	_	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:
7		0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
Herb Stratum (Plot size: 10 feet)		= Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
		F0.00/	EAC	Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum		50.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Epilobium coloratum		20.0%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Persicaria pensylvanica		10.0%	FACW	, ,
4. Scirpus atrovirens	10	10.0%	OBL	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Typha latifolia		10.0%	OBL	
6	0			Five Vegetation Strata:
7	0	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	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 than
11		0.0%		3 in. (7.6 cm) DBH.
12		0.0%		Shrub stratum – Consists of woody plants, excluding woody
	100 :	= Total Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	0	0.0%		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 m) in height.
2 3.		0.0%		Woody vines – Consists of all woody vines, regardless of
		0.0%		height.
4				
5		0.0%		Hydrophytic
6	0_	0.0%		Vegetation Yes • No •
	0	= Total Cove	r	Tradenti
Remarks: (Include photo numbers here or on a separate sh	eet.)		_	

Soil Sampling Point: INC-W-009 (PEM)

Profile Descr		the depth	needed to d				onfirm the	absence of indicators.)				
Depth (inches)	Matrix Color (moist)	%	Color (Redox Features 1 Loc2		Texture	Domanica					
<u>(inches)</u> 0-4	2.5Y 4/1	90	5YR	5/6	10	C	M	Silt Loam	Remarks			
								-				
4-20	N 5/1	_ 90	5YR	5/6		C	M	Silty Clay	-			
	-		-						-			
			-		-			-				
				-	-	-	-					
1- 0.0						16 16						
		on. RM=Redi	uced Matrix,	CS=Covere	ed or Coate	a Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=1				
Hydric Soil 1				5 6 6	C=)			Indicators for Prob	lematic Hydric Soils ³ :			
Histosol (,			Surface (CO) (MI DA	147 140\	2 cm Muck (A10) (MLRA 147)			
Black Hist	pedon (A2)					S8) (MLRA ILRA 147,		Coast Prairie Rec	lox (A16)			
	Sulfide (A4)				Matrix (F2)		140)	(MLRA 147,148)				
	Layers (A5)			eted Matri				Piedmont Flood (MLRA 136, 147				
	k (A10) (LRR N)			ox Dark Su				_ ` ′	,			
	Below Dark Surface (A	\11)			Surface (F	7)		✓ Very Shallow Dark Surface (TF12)✓ Other (Explain in Remarks)				
	k Surface (A12)	(11)	_	x Depress	-	,						
	ıck Mineral (S1) (LRR I	N.			e Masses (F12) (LRR	N,					
MLRA 147	7, 148)	,		A 136)								
Sandy Gle	eyed Matrix (S4)		_			.RA 136, 12		³ Indicators o	f hydrophytic vegetation and			
Sandy Re						(F19) (ML		wetland hy	drology must be present,			
Stripped I	Matrix (S6)		Red	Parent Ma	terial (F21)	(MLRA 12	7, 147)	unless o	listurbed or problematic.			
Restrictive L	ayer (if observed):											
Туре:												
Depth (inc	hes):							Hydric Soil Present?	Yes No			
Remarks:												

Project/Site: Indiantown Gap Natio	ional Cemetery Expansion Project	City/County: East Hanover, L	.ebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Asso	ociates, Inc.	State: PA	A Sampling Point: INC-W-009 (UPL)
Investigator(s): Bridger Thompson	n	Section, Township, Range: 5	TR
	: Swale	Local relief (concave, convex,	none): concave Slope: 8.7 % / 5.0 °
Subregion (LRR or MLRA): MLR	RA 147 in LRR S Lat	- t.: 40.41995301 Lo	ong.: -76.56166132
	channery silt loam, 15 to 25 perce		NWI classification: N/A
		0 0	
	s on the site typical for this time of	•	o, explain in Remarks.)
Are Vegetation, Soil	, or Hydrology	intly disturbed? Are "Norma	al Circumstances" present? Yes Vo No
Are Vegetation, Soil	, or Hydrology 🔲 naturall	y problematic? (If needed,	explain any answers in Remarks.)
Summary of Findings - A	Attach site map showing	sampling point location	ns, transects, important features, etc.
Hydrophytic Vegetation Present?	? Yes • No O		
Hydric Soil Present?	Yes O No 💿	Is the Sampled Area	Yes ○ No ●
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?	res U No U
Remarks:			
Upland data point collected to v boundary.	erify the wetland boundary. The d	lata point is located ion the edge	of a constructed swale adjacent to the wetland
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of	f one required; check all that apply	r)	Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Pla	ants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfid	` '	Drainage Patterns (B10)
Saturation (A3)		pheres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Rec	duced Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Rec	duction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	Thin Muck Surfa	ace (C7)	Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)	Other (Explain i	n Remarks)	Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)			Geomorphic Position (D2)
Inundation Visible on Aerial Imag	gery (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	١.	
	O O		
Catamatica Duranata			drology Present? Yes O No 💿
(includes capillary fringe) Yes	O No Depth (inches):	
Describe Recorded Data (stream	n gauge, monitoring well, aerial pho	otos, previous inspections), if ava	ailable:
Remarks:			
The region is experiencing very of	dry and drought like conditions.		

Tree Stratum (Plot size:) 1)	Absolute % Cover		Indicator Status	Dominance Test worksheet:
	% Cover	Cover	Status	
1				Number of Dominant Species
1.	0			That are OBL, FACW, or FAC: (A)
2	0			Total Number of Dominant
3	0	0.0%		Species Across All Strata: 2 (B)
4	0	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%		Prevalence Index worksheet:
8		0.0%		Total % Cover of: Multiply by:
	0 :	= Total Cover		OBL species 0 x 1 =0
Sapling-Sapling/Shrub Stratum (Plot size:)			FACW species $0 \times 2 = 0$
1	0			FAC species 90 x 3 = 270
2	0_			FACU species $10 \times 4 = 40$
3	0			
4	0			l '
5	0			Column Totals: $\underline{100}$ (A) $\underline{310}$ (B)
6	0	0.0%		Prevalence Index = B/A =3.100_
7	0	0.0%		Hydrophytic Vegetation Indicators:
8		0.0%		Rapid Test for Hydrophytic Vegetation
9	_	0.0%		✓ Dominance Test is > 50%
0	0	0.0%		Prevalence Index is ≤3.0 ¹
		= Total Cover		
Shrub Stratum (Plot size: 15 feet)	10	✓ 100.0%	EAC	Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
1. Rubus idaeus		0.0%	TAC	Problematic Hydrophytic Vegetation ¹ (Explain)
2		0.0%		
3				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4				
5				Definition of Vegetation Strata:
6	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), regardless
Herb Stratum (Plot size: 10 feet)	10:	= Total Cover		of height.
1. Microstegium vimineum	80	✓ 88.9%	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. Solidago canadensis	10	11.1%	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	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0	0.0%		in height.
6	0	0.0%		<u> </u>
7	_	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%		diameter at breast height (DBH).
		0.0%		Sapling stratum – Consists of woody plants, excluding woody
0 1		0.0%		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
2	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 species, except woody vines, less than approximately 3 ft (1 m)
2		0.0%		in height.
3		0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%		Hadanahari
6.		0.0%		Hydrophytic Vegetation
.		= Total Cover		Present? Yes No
		30101		

Soil Sampling Point: INC-W-009 (UPL)

Profile Descri	iption: (De	escribe to	the depth	needed to document	the indica	tor or co	nfirm the a	absence of indicators.)		
Depth		Matrix		Redox Features						
(inches)		(moist)	%	Color (moist)	%	_Tvpe_1	Loc2	<u>Texture</u>	Remarks	
0-4	10YR	3/4			-			Silt Loam		
4-16	10YR	5/4	100					Silty Clay		
16-20	10YR	5/6	100					Clay Loam		
-	-							-		
					-	-		-		
		_								
1 Type: C-Conc	contration I	D-Denletic	n PM-Padı	aced Matrix CS-Covers	nd or Coate	d Sand Gra	aine 21 oca	tion: PL=Pore Lining. M=M	atriv	
Hydric Soil I			iii. Kiii–Keut	iced Madrix, C3-Covere	cu or coate	Janu Gre	allis -Loca			
		i		Dark Surface (271			Indicators for Proble	ematic Hydric Soils ³ :	
`	☐ Histosol (A1)☐ Dark Surface (S7)☐ Histic Epipedon (A2)☐ Polyvalue Below Surface (S8) (MLRA 147,148)		147 148)	2 cm Muck (A10)	(MLRA 147)					
Black Histi				Thin Dark Surfa	-			Coast Prairie Redo	ox (A16)	
	Sulfide (A4	+)		Loamy Gleyed				(MLRA 147,148)	. 6 .1 (540)	
	Layers (A5)			Depleted Matri:				Piedmont Floodpl (MLRA 136, 147)	ain Soils (F19)	
2 cm Muck	k (A10) (LR	R N)		Redox Dark Su				(MLRA 136, 147) Very Shallow Dark Surface (TF12) Other (Explain in Remarks)		
Depleted E	Below Dark	Surface (A	11)	Depleted Dark	Surface (F7)				
Thick Dark	k Surface (A	A12)		Redox Depress	ions (F8)					
Sandy Mud MLRA 147	ck Mineral (', 148)	(S1) (LRR I	١,	Iron-Manganes MLRA 136)	e Masses (F	12) (LRR	N,			
	yed Matrix	(S4)		Umbric Surface	e (F13) (MLI	RA 136, 12	22)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,		
Sandy Rec		()		Piedmont Floor	dplain Soils	(F19) (MLI	RA 148)			
Stripped M				Red Parent Ma	terial (F21)	(MLRA 12	7, 147)		sturbed or problematic.	
Restrictive La	ayer (if ob	served):								
Туре:										
Depth (inch	nes):							Hydric Soil Present?	Yes O No 💿	
Remarks:										

Project/Site: Indiantown Gap	National Cemetery Expansion Proje	ect City/County: East Hanove	er, Lebanon Co. Sampling D	Date: 08-Oct-20
Applicant/Owner: Mabbett &	Associates, Inc.	State:	PA Sampling Point:	INC-W-010 (PEM)
Investigator(s): Bridger Tho	mpson	Section, Township, Rang	e: S T	R
Landform (hillslope, terrace, e	etc.): Hillside	Local relief (concave, conv	ex, none): CONVEX Slop	e: <u>8.7</u> %/ 5.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.: 40.42058597	Long.: -76.55926842	Datum: NAD-83
Soil Map Unit Name: WeD-V	Veikert channery silt loam, 15 t		NWI classification: N/A	
	tions on the site typical for this	0 0	f no, explain in Remarks.)	
Are Vegetation $oxedsymbol{\square}$, Soil				Yes No
			ima encambances present.	
Are Vegetation	_ , ,	naturally problematic? (If need Owing sampling point locat	led, explain any answers in Remar tions, transects, importa	,
Hydrophytic Vegetation Pres				•
Hydric Soil Present?	Yes No	Is the Sampled Ar	ea	
Wetland Hydrology Present?	Vac 🕟 Na 🔾	within a Wetland?		
Remarks:				
		iditions. The data point is located in s boundary is defined by the topograp		
Hydrology				
Wetland Hydrology Indicato	rs:		_Secondary Indicators (minimum	of two required)
Primary Indicators (minimu	m of one required; check all th	at apply)	Surface Soil Cracks (B6)	
Surface Water (A1)	True A	quatic Plants (B14)	Sparsely Vegetated Concave	Surface (B8)
High Water Table (A2)	Hydrog	gen Sulfide Odor (C1)	Drainage Patterns (B10)	
✓ Saturation (A3)	Oxidize	ed Rhizospheres along Living Roots (C3)	Moss Trim Lines (B16)	
Water Marks (B1)	Presen	ce of Reduced Iron (C4)	Dry Season Water Table (C2	2)
Sediment Deposits (B2)	Recent	Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)	
Drift deposits (B3)	Thin M	uck Surface (C7)	Saturation Visible on Aerial I	magery (C9)
Algal Mat or Crust (B4)	Other ((Explain in Remarks)	Stunted or Stressed Plants (I	D1)
Iron Deposits (B5)			Geomorphic Position (D2)	
Inundation Visible on Aeria	Imagery (B7)		Shallow Aquitard (D3)	
Water-Stained Leaves (B9)			Microtopographic Relief (D4))
Aquatic Fauna (B13)			✓ FAC-neutral Test (D5)	
Field Observations:	Yes O No O Deptl	- (
		n (inches):		
		n (inches): Wetland	Hydrology Present? Yes •	No O
Saturation Present? (includes capillary fringe)	Yes No Depti	n (inches):0		
Describe Recorded Data (str	eam gauge, monitoring well, a	erial photos, previous inspections), if	available:	
Remarks:				
The region is experiencing v	ery dry and drought like condit	tions.		

		Dominant		Sampling Point: <u>INC-W-010 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		Indicator Status	Dominance Test worksheet:
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC: 4(A)
2	0	0.0%		
3		0.0%		Total Number of Dominant Species Across All Strata: 4 (B)
4.	_	0.0%		Species Across Air Strate.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: $\underline{100.0\%}$ (A/B)
6		0.0%		Dravalones Index weekshoots
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:	_) :	= Total Cover		OBL species $20 \times 1 = 20$
1	_	0.0%		FACW species $50 \times 2 = 100$
2		0.0%		FAC species 30 x 3 = 90
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
5		0.0%		Column Totals: 100 (A) 210 (B)
6		0.0%		Dravalance Index P/A 2 100
7		0.0%		Prevalence Index = B/A = 2.100
		0.0%		Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	_	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	0.0%		☐ 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: 10 feet)		= Total Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	20	20.00/	EAC	Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	30	30.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Epilobium coloratum		20.0%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3. Scirpus atrovirens		20.0%	OBL	, ,
4. Persicaria pensylvanica	10	10.0%	FACW	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
5. Bidens frondosa		20.0%	FACW	
6	0	0.0%		Five Vegetation Strata:
7	0	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	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 than
11	0	0.0%		3 in. (7.6 cm) DBH.
12		0.0%		Shrub stratum – Consists of woody plants, excluding woody
	100 :	= Total Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	0	0.0%		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 m) in height.
2 3.		0.0%	-	Woody vines – Consists of all woody vines, regardless of
		0.0%		height.
4				
5		0.0%		Hydrophytic
6		0.0%		Vegetation Present? Yes No
	0	= Total Cove	r	Frederic: 100
Remarks: (Include photo numbers here or on a separate sh	eet.)			

Soil Sampling Point: INC-W-010 (PEM)

Profile Descr		the depth	needed to				nfirm the	absence of indicators.)				
Depth	Matrix		Redox Features Color (moist) % Type 1 Loc2		Touture							
(inches)	Color (moist)	%			%_	Type 1	Loc²	<u>Texture</u>	Remarks			
0-6	10YR 4/2		5YR	5/6	_ 10	C	M	Silt Loam				
6-12	10YR 4/2	80	5YR	5/6	10	C	M	Silty Clay				
12-20	10YR 5/2	80	5YR	5/6	10	С	М	Clay Loam				
							-					
	-		-					-				
					_							
1	- D D - I - E			- CC - C	- d C t	- 1 6 1 6		Harry DL. David Living M. M.				
		on. RM=Redu	iced Matrix,	CS=Cover	ed or Coate	ed Sand Gra	ins ² Loca	ation: PL=Pore Lining. M=M				
Hydric Soil 1					67)			Indicators for Proble	ematic Hydric Soils ³ :			
Histosol (•			k Surface ((CO) (MI DA	147 140)	2 cm Muck (A10)	(MLRA 147)			
Black Hist	pedon (A2) ic (Δ3)					(S8) (MLRA //I RA 147 1		Coast Prairie Redo	ox (A16)			
	ic (A3) i Sulfide (A4)		☐ Thin Dark Surface (S9) (MLRA 147, 148) ☐ Loamy Gleyed Matrix (F2)				¬0)	(MLRA 147,148)				
	Layers (A5)			oleted Matri)		Piedmont Floodpl	ain Soils (F19)			
	k (A10) (LRR N)			lox Dark Su				(MLRA 136, 147) Very Shallow Dark Surface (TF12)				
	Below Dark Surface (A	111)		leted Dark	. ,	7)						
	k Surface (A12)	,		lox Depress		,		Uther (Explain in Remarks)				
	ıck Mineral (S1) (LRR I	N.			se Masses	(F12) (LRR I	٧,					
MLRA 147	7, 148)	-,		RA 136)								
Sandy Gle	eyed Matrix (S4)					LRA 136, 12		³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
Sandy Re	dox (S5)		Pie	dmont Floo	dplain Soils	s (F19) (MLF	RA 148)					
Stripped I	Matrix (S6)		Red	l Parent Ma	iterial (F21) (MLRA 127	7, 147)	unless dis	sturbed or problematic.			
Restrictive L	ayer (if observed):											
Туре:												
Depth (inc	hes):							Hydric Soil Present?	Yes No			
Remarks:												
Surface wate	r infiltration is slight	tly restricte	d by a sh	allow clay	layer.							
	_	•	·	•	·							
ſ												

Project/Site: Indiantown Gap N	ational Cemetery Expansion Project	City/County: East Hanover, I	Lebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & As	ssociates, Inc.	State: P	Sampling Point: INC-W-010 (UPL)
Investigator(s): Bridger Thomp	son	Section, Township, Range:	S T R
Landform (hillslope, terrace, etc	:.): Hillside	Local relief (concave, convex,	none): convex Slope: 8.7 % / 5.0
Subregion (LRR or MLRA): M	LRA 147 in LRR S Lat	: 40.4205541 L o	ong.: -76.55922625
_	ikert channery silt loam, 15 to 25 pe		NWI classification: N/A
Are climatic/hydrologic conditio	ons on the site typical for this time of	year? Yes 💿 No 🔾 (If n	o, explain in Remarks.)
Are Vegetation $\ igcup\ $, Soil $\ igcup\ $, or Hydrology 🗌 significa	ntly disturbed? Are "Norm	al Circumstances" present? Yes No
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$, or Hydrology 🗌 naturally	problematic? (If needed	, explain any answers in Remarks.)
Summary of Findings	<u> </u>	sampling point locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Presen			
Hydric Soil Present?			Yes ○ No ●
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?	165 5 110 5
Remarks: Upland data point collected to wetland boundary.	o verify the wetland boundary. The d	ata point is located on a slight h	ill slope a in a wooded/shrubby lot adjacent to the
Hydrology			
Wetland Hydrology Indicators	:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum	of one required; check all that apply		Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Pla	nts (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfid	e Odor (C1)	Drainage Patterns (B10)
Saturation (A3)	Oxidized Rhizos	oheres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Red	uced Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Rec	uction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surfa	ce (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in	n Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)			Geomorphic Position (D2)
Inundation Visible on Aerial In	nagery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)			FAC-neutral Test (D5)
Field Observations:	es No Depth (inches)		
	-1- (:	
	es O No O Depth (inches)		drology Present? Yes O No •
Saturation Present? (includes capillary fringe)	os O No O Depth (inches)	:	drology Present? Tes C NO C
	m gauge, monitoring well, aerial pho	otos, previous inspections), if ava	ailable:
Remarks:			

			minant		Sampling Point: <u>INC-W-010 (UPL)</u>
	Absolute % Cover	Re		Indicator Status	Dominance Test worksheet:
1 . Juglans nigra	30	V _	100.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:
2	0_		0.0%		
3	0		0.0%		Total Number of Dominant Species Across All Strata: 4 (B)
4	_		0.0%		(b)
5			0.0%		Percent of dominant Species
		$\overline{\Box}$	0.0%		That Are OBL, FACW, or FAC: 25.0% (A/B)
6		Η-			
7		H-	0.0%		Prevalence Index worksheet:
8		Ш.	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	30	= To	tal Cover		OBL species 0 x 1 = 0 FACW species 0 x 2 = 0
1	0_		0.0%		
2			0.0%		FAC species $40 \times 3 = 120$
3	0		0.0%		FACU species $50 \times 4 = 200$
4	_		0.0%		UPL species $30 \times 5 = 150$
5			0.0%		Column Totals: <u>120</u> (A) <u>470</u> (B)
6	_	$\overline{\Box}$	0.0%		Dravalance Index - P/A - 2 017
		\Box	0.0%		Prevalence Index = B/A = 3.917
7			0.0%		Hydrophytic Vegetation Indicators:
8		Н-			Rapid Test for Hydrophytic Vegetation
9		⊢-	0.0%		☐ Dominance Test is > 50%
10	_	Ш.	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)	0	= To	tal Cover		Morphological Adaptations ¹ (Provide supporting
1. Elaeagnus umbellata	30	✓	50.0%	UPL	data in Remarks or on a separate sheet)
2. Lonicera tatarica	20	✓	33.3%	FACU	\square Problematic Hydrophytic Vegetation 1 (Explain)
3. Rubus idaeus	10		16.7%	FAC	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:
		$\overline{\Box}$	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), regardless
Herb Stratum (Plot size: 10 feet)	60	_	tal Cover		of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	30	✓_	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0		0.0%		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		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0		0.0%		in height.
6.	0		0.0%		Fire Wasshallow Churcher
7	0	\Box	0.0%		Five Vegetation Strata:
		\Box	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
8	0		0.0%		diameter at breast height (DBH).
9		Н-			Sapling stratum – Consists of woody plants, excluding woody
10		H-	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	Ш.	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	30	= 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 m)
2	0		0.0%		in height.
3	0_		0.0%		Woody vines – Consists of all woody vines, regardless of
4	0		0.0%		height.
5	0		0.0%	_	
6.	0		0.0%		Hydrophytic Vegetation
·	0	= To	tal Cover		Present? Yes No •
Remarks: (Include photo numbers here or on a separate shee	et.)				

Soil Sampling Point: INC-W-010 (UPL)

Depth	Matri	x		Re	dox Featu							
(inches)	Color (moist)		Color ((moist)	%_	Tvpe 1	Loc ²	Texture	Remarks			
0-6	10YR 4/4							Silt Loam				
6-12	10YR 4/3	100						Silty Clay				
12-20	10YR 5/3	95	5YR	5/6	5	С	М	Clay Loam				
				-								
				-								
Type: C=Conc	centration. D=Deple	etion. RM=Redu	iced Matrix,	CS=Cover	ed or Coate	d Sand Grai	ns ²Loca	tion: PL=Pore Lining. M=M	atrix			
lydric Soil I									ematic Hydric Soils ³ :			
Histosol (A				k Surface (2 cm Muck (A10)	-			
Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 147,148)					Coast Prairie Red							
Black Histi						ILRA 147, 1	18)	(MLRA 147,148)	OX (A16)			
_	Sulfide (A4)				Matrix (F2)			Piedmont Floodpl	ain Soils (F19)			
_	Layers (A5)			leted Matri				(MLRA 136, 147)				
_	2 cm Muck (A10) (LRR N)							☐ Very Shallow Dar				
_ '	веюw Dark Surrace k Surface (A12)							Other (Explain in	Remarks)			
_	ck Mineral (S1) (LR	R N.		•	. ,	F12) (LRR N	,					
MLRA 147	', 148)	X IV,		A 136)	·	, ,						
Sandy Gle	yed Matrix (S4)					.RA 136, 12		3 Indicators of	hydrophytic vegetation and			
Sandy Red						(F19) (MLR		wetland hyd	drology must be present,			
			Dod	Parent Ma	iterial (F21)	(MLRA 127	, 147)	unless di	sturbed or problematic.			
Stripped №	Matrix (S6)		Reu									
	Matrix (S6) ayer (if observed)):	Keu									
):	Reu									
estrictive La	ayer (if observed)		Reu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Reu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Reu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No •			
estrictive La Type: Depth (inch	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No ●			
Restrictive La	ayer (if observed)		Keu					Hydric Soil Present?	Yes ○ No ●			
Restrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
Restrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes O No O			
estrictive La Type: Depth (inch	ayer (if observed)							Hydric Soil Present?	Yes ○ No ●			

Project/Site: Indiantown Gap National	Cemetery Expansion Project	City/County: East Hanover, Le	banon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Associate	es, Inc.	State: PA	Sampling Point: INC-W-011 (PEM)
Investigator(s): Bridger Thompson		Section, Township, Range: S	T R
Landform (hillslope, terrace, etc.):	Bench	Local relief (concave, convex, n	one): concave Slope: 0.0 % / 0.0 °
		40.42180631 Lon	g.: -76.56021074
Soil Map Unit Name: WeD-Weikert			NWI classification: N/A
Are climatic/hydrologic conditions on	the site typical for this time of ye	ear? Yes O No 💿 (If no,	explain in Remarks.)
Are Vegetation, Soil		,	Circumstances" present? Yes ● No ○
Are Vegetation $\ \square$, Soil $\ \square$, or Hydrology $\ \ \Box$ naturally p	roblematic? (If needed, e	explain any answers in Remarks.)
Summary of Findings - Att	ach site map showing s	ampling point location	s, 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?	res © No C
Remarks:			
can be more percisely classified as		opography of the depression and	d the non-vegetated concave surface. The wetland
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one	e required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plants	s (B14)	✓ Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide C	Odor (C1)	Drainage Patterns (B10)
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)	☐ 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)			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):		
	., ,	Wetland Hydr	ology Present? Yes No
(includes capillary fringe) Yes	No O Depth (inches):	0	
Describe Recorded Data (stream gai	uge, monitoring well, aerial photo	s, previous inspections), if avail	able:
Remarks:			
The region is experiencing very dry	and drought like conditions.		

1.	trat. r Indicator Status Dominance Test worksheet: 0.0% Dominant Species That are OBL, FACW, or FAC: 3 (A) 0.0% Dominant Species That are OBL, FACW, or FAC: 3 (A) 0.0% Dominant Species That Are OBL, FACW, or FAC: 3 (B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B) 0.0% Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
2.	That are OBL, FACW, or FAC: 3
3.	Total Number of Dominant Species Across All Strata:
4.	Species Across All Strata: 3 (B)
4.	Percent of dominant Species 100.0% (A/B)
6.	That Are OBL, FACW, or FAC: 100.0% (A/B) 10.0% Prevalence Index worksheet: Total % Cover of: Multiply by: O.0% OBL species 10 x 1 = 10 FACW species 10 x 2 = 20 FAC species 10 x 3 = 30 FAC species 0 x 4 = 0 UPL species 0 x 5 = 0
7. 0 0.0% 8. 0 0.0% Sapling-Sapling/Shrub Stratum 0 0.0% 1. 0 0.0% 2. 0 0.0% 3. 0 0.0% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0.0% 0.0% 2. 0 0.0% 3. 0 0.0% 4. 0 0.0% 4. 0 0.0% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0.0% 0.0% 10. 0.0% 0.0% 10. 0.0% 0.0% 10. 0.0% 0.0% <td> D.0% Prevalence Index worksheet: Total % Cover of: Multiply by: </td>	D.0% Prevalence Index worksheet: Total % Cover of: Multiply by:
8.	Total % Cover of: Multiply by: Cover OBL species 10 x 1 = 10 FACW species 10 x 2 = 20 FAC species 10 x 3 = 30 FAC species 0 x 4 = 0 O.0% UPL species 0 x 5 = 0
Sapling-Sapling/Shrub Stratum	Cover OBL species 10
Sapling-Sapling/Shrub Stratum Plot size:	FACW species 10 x 2 = 20 FAC species 10 x 3 = 30 FACU species 0 x 4 = 0 UPL species 0 x 5 = 0
1.	FAC species 10
2.	FACU species $0 \times 4 = 0$ 0.0% UPL species $0 \times 5 = 0$
3.	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
4.	5.0%
5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 2. 0 0.0% 3. 0 0.0% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 1. Microstegium vimineum 10 3.33% 2. Scirpus atrovirens 10 3.33% 3. Persicaria pensylvanica 10 3.33% 4. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0.0% 0.0% 11. 0 0.0% 12. 0 0.0% 12. 0 0.0% 13. 0 0.0% 14. 0 0.0	
6.	0.0% Column Totals: 30 (A) 60 (B)
8.	0.0% Prevalence Index = B/A = 2.000
8.	,
9.	
O.	0.0%
Shrub Stratum (Plot size:	
1.	Cover
2.	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
3.	Destination of the state of the
4	
5. 0 0.0% 6. 0 0.0% 7. 0 0.0% Herb Stratum (Plot size: 10 feet) 0 = Total Cove 1. Microsteglum vimineum 10 33.3% 2. Scirpus atrovirens 10 33.3% 3. Persicaria pensylvanica 10 33.3% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0 0.0% 10. 0	he present upless disturbed or problematic
6.	
7	
Herb Stratum (Plot size: 10 feet)	Tree stratum - Consists of woody plants, excluding vines 3 in
Merb Stratum (Flot size: To feet) 1. Microstegium vimineum 10 ✓ 33.3% 2. Scirpus atrovirens 10 ✓ 33.3% 3. Persicaria pensylvanica 10 ✓ 33.3% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 11. 0 0.0% 12. 0 0.0% Woody Vine Stratum (Plot size:) 0 0.0% 1. 0 0.0%	(7.6 cm) or more in diameter at breast height (DBH), regardless
2. Scirpus atrovirens 10 ✓ 33.3% 3. Persicaria pensylvanica 10 ✓ 33.3% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 11. 0 0.0% 12. 0 0.0% Woody Vine Stratum (Plot size:) 30 = Total Cove 1. 0 0.0%	Sapling/shrub stratum – Consists of woody plants, excluding
3. Persicaria pensylvanica 4	3.3% FAC vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
4.	regardings of size and all other plants less than 2.20 ft tall
5.	
6.	lin height.
7.	
8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 11. 0 0.0% 22. 0 0.0% Woody Vine Stratum (Plot size:) 30 = Total Cove	Five Vegetation Strata:
9.	Tree - Woody plants, excluding woody vines, approximately 20
O. O. O. O. O. O. O. O.	diameter at breast height (DRH)
1. 0 0.0% 12. 0 0.0% Woody Vine Stratum (Plot size:) 30 = Total Cove 1. 0 0.0%	Sapling stratum – Consists of woody plants, excluding woody
2	vines, approximately 20 ft (6 m) or more in height and less than
Woody Vine Stratum (Plot size:	
1	vines, approximately 3 to 20 ft (1 to 6 m) in height.
1.	Herb stratum – Consists of all herbaceous (non-woody) plants,
	0.0% including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m)
3	= [
4	0.0% Woody vines – Consists of all woody vines, regardless of
5. 0 0 0.0%	0.0% Woody vines – Consists of all woody vines, regardless of
6. 0 0.0%	Woody vines – Consists of all woody vines, regardless of height.
	Woody vines – Consists of all woody vines, regardless of height. Hydrophytic
Remarks: (Include photo numbers here or on a separate sheet.)	Woody vines – Consists of all woody vines, regardless of height. Hydrophytic Vegetation Pascent? Yes • No

Soil Sampling Point: INC-W-011 (PEM)

Profile Descr		absence of indicators.)										
Depth	Depth Matrix Redox Features Inches Color (moist) % Color (moist) % Type 1 Loc					1 2		B				
(inches) 0-10	Color (moist) 2.5Y 5/1	80			%_ 20	Tvpe ¹	Loc² M	Texture Silt Loam	Remarks			
			5YR	5/6				-				
10-20	2.5Y 5/3	80	5YR	5/6	20	C	M	Clay Loam				
	-			-				•				
			-					-				
-			-	-	-		-	-				
¹ Type: C=Con	centration. D=Depletic	on. RM=Redu	iced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=M	latrix			
Hydric Soil 1	Indicators:							Indicators for Probl	ematic Hydric Soils ³ :			
Histosol (A1)		Dar	k Surface (S7)			2 cm Muck (A10)	•			
Histic Epi	oedon (A2)		Poly	value Belo	w Surface	(S8) (MLRA	147,148)					
Black Hist	☐ Black Histic (A3) ☐ Thin Dark Surface (S9) (MLRA 147, 148)					148)	Coast Prairie Red (MLRA 147,148)	ox (A16)				
Hydrogen	Sulfide (A4)		Loa	my Gleyed	Matrix (F2)		Piedmont Floodp	lain Soils (F19)			
Stratified	Layers (A5)		✓ Dep	leted Matri	x (F3)			(MLRA 136, 147)				
2 cm Muc	k (A10) (LRR N)		_	ox Dark Su	. ,			Very Shallow Dar	k Surface (TF12)			
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7)								Other (Explain in	Remarks)			
Thick Dar	Thick Dark Surface (A12) Redox Depressions (F8)											
Sandy Mu MLRA 147	ick Mineral (S1) (LRR N 7, 148)	N,		i-Manganes (A 136)	se Masses ((F12) (LRR	N,					
Sandy Gle	eyed Matrix (S4)		Um	bric Surface	e (F13) (MI	LRA 136, 12	22)	3				
☐ Sandy Re			Pied	lmont Floo	dplain Soils	s (F19) (MLI	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.				
Stripped I	Matrix (S6)		Rec	Parent Ma	iterial (F21) (MLRA 12	7, 147)					
Postrictivo I	ayer (if observed):											
Type:	ayer (ii observeu).											
Depth (inc	hes):							Hydric Soil Present?	Yes 💿 No 🔾			
Remarks:												
Kemarks.												
1												
İ												

Project/Site: Indiantown Gap I	National Cemetery Expans	sion Project C	ity/County: East Hanover, L	_ebanon Co.	Sampling D	ate: 08-Oct-20
Applicant/Owner: Mabbett & A	Associates, Inc.		State: P	Α :	Sampling Point:	INC-W-011 (UPL)
Investigator(s): Bridger Thom	pson	5	Section, Township, Range:		т	R
andform (hillslope, terrace, et	c.): Bench	Lo	cal relief (concave, convex,	none): COI	ncave Slop	e:0.0 % /0.0 °
	MLRA 147 in LRR S).42174219 Lo	ong.: -76.560		
Soil Map Unit Name: WeD-W					assification: N/A	_
			0 0			٦
Are climatic/hydrologic conditi			`	o, explain in R	· ·	Yes ● No ○
Are Vegetation, Soil	, or Hydrology	significantly d	listurbed? Are "Norma	al Circumstand	ces" present?	res 🔍 No 🔾
Are Vegetation $\ \ \ \ \ \ \ $, Soil	, or Hydrology	naturally prob	olematic? (If needed,	, explain any a	nswers in Remar	ks.)
Summary of Findings			mpling point locatio	ns, transe	cts, importa	nt features, etc.
Hydrophytic Vegetation Prese						
Hydric Soil Present?	Yes 🔾 No	•	Is the Sampled Area	Yes ○ No	•	
Wetland Hydrology Present?	Yes 🔾 No	\odot	within a Wetland?	105 0 110		
Remarks:						
Hydrology						
Wetland Hydrology Indicators					ndicators (minimum	of two required)
Primary Indicators (minimum	n of one required; che				Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plants (B			Vegetated Concave	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide Odo	` '		Patterns (B10)	
Saturation (A3) Water Marks (B1)			s along Living Roots (C3)		m Lines (B16)	
Sediment Deposits (B2)		Presence of Reduced : Recent Iron Reduction	• •		on Water Table (C2) Burrows (C8))
Drift deposits (B3)		Thin Muck Surface (C7	* *		n Visible on Aerial I	magany (CQ)
Algal Mat or Crust (B4)		Other (Explain in Rem	•		or Stressed Plants (E	
Iron Deposits (B5)) Other (Explain in Rem	diks)		phic Position (D2)) <u> </u>
Inundation Visible on Aerial 1	Imagery (B7)				Aquitard (D3)	
Water-Stained Leaves (B9)					ographic Relief (D4)	
Aquatic Fauna (B13)					tral Test (D5)	
Field Observations:						
Surface Water Present?	′es ○ No •	Depth (inches):				
Water Table Present?	′es ○ No ⊙	Depth (inches):				(2)
Saturation Present?	'es ○ No •	Depth (inches):	Wetland Hyd	drology Presei	nt? Yes	No •
(includes capillary fringe) Describe Recorded Data (stre			nrevious inspections) if ava	ailable:		
Describe Recorded Data (stre	am gaage, moniconing	well, derial priotos, i	previous inspections), ii uve	andbic.		
Remarks:						
The region is experiencing ve	erv drv and drought lik	e conditions.				
The region is expensely re	,,	0 00.101.01.01				

		Sampling Point: INC-W-011 (UPL) ——Species?				
Tree Stratum (Plot size: <u>30 feet</u>)	Absolute % Cover	Rel.	Strat.	Indicator Status	Dominance Test worksheet:	
1. Carya ovata	20		66.7%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:	
2. Quercus alba	10	_ _	33.3%	FACU	Total Number of Dominant	
3	0		0.0%		Species Across All Strata:5 (B)	
4		\square_{-}	0.0%			
5	0		0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)	
6	0		0.0%		That Are OBL, FACW, OF FAC.	
7	0	Ш_	0.0%		Prevalence Index worksheet:	
8	0		0.0%		Total % Cover of: Multiply by:	
Sapling-Sapling/Shrub Stratum (Plot size:)	30	= Tota	al Cover		OBL species 0 x 1 = 0 FACW species 0 x 2 = 0	
1	0		0.0%			
2	0		0.0%		FAC species $10 \times 3 = 30$	
3	0		0.0%		FACU species $50 \times 4 = 200$	
4	0		0.0%		UPL species $0 \times 5 = 0$	
5	0		0.0%		Column Totals: <u>60</u> (A) <u>230</u> (B)	
6	_		0.0%		Prevalence Index = B/A = 3.833	
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 feet)	_	= Tota	al Cover		Morphological Adaptations ¹ (Provide supporting	
1. Rosa multiflora	10	✓	100.0%	FACU	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:	
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), regardless	
Herb Stratum (Plot size: 10 feet)	10	= Tota	al Cover		of height.	
1. Microstegium vimineum	10	✓	50.0%	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. Alliaria petiolata	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		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft	
5	0		0.0%		in height.	
6	0		0.0%		Five 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).	
10	0		0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than	
11	0		0.0%		3 in. (7.6 cm) DBH.	
12	0		0.0%		Shrub stratum – Consists of woody plants, excluding woody	
Woody Vine Stratum (Plot size:)	20	= Tota	al Cover		vines, approximately 3 to 20 ft (1 to 6 m) in height. 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 m)	
2	0		0.0%		in height.	
3	0	\square _	0.0%		Woody vines – Consists of all woody vines, regardless of	
4	0	Ш_	0.0%		height.	
5	0		0.0%		Hydrophytic	
6	0		0.0%		Vegetation No. 0	
	0	= Tot	tal Cover		Present? Yes ONO	
Remarks: (Include photo numbers here or on a separate shee	et.)					

Soil Sampling Point: INC-W-011 (UPL)

Profile Descri	iption: (D	escribe to	the depth	needed to document	the indica	tor or co	nfirm the a	absence of indicators.)						
Depth		Matrix		Re	dox Featu									
(inches)		(moist)		Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks					
	2.5Y	4/4		-	-			Silt Loam						
6-12	2.5Y	5/3	100					Silty Clay						
12-20	2.5Y	5/4						Clay Loam						
	-													
-								-						
								-						
¹ Type: C=Cond	centration.	D=Depletio	n. RM=Redi	uced Matrix. CS=Covere	ed or Coate	d Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix					
Hydric Soil I			m ra raca	accurrating co covers	ed of course	a Suria Gre	1115 2000							
Histosol (A		•		Dark Surface (S7)			Indicators for Proble						
Histic Epip	•			Polyvalue Belov	,	8) (MLRA	147,148)	2 cm Muck (A10)	(MLRA 147)					
Black Histi				☐ Thin Dark Surfa	-			Coast Prairie Redo (MLRA 147,148)	ox (A16)					
Hydrogen	Sulfide (A4	4)		Loamy Gleyed				Piedmont Floodpl	ain Soile (F10)					
Stratified L	Layers (A5))		Depleted Matri				(MLRA 136, 147)	uiii 50115 (1 1 <i>5)</i>					
2 cm Muck	2 cm Muck (A10) (LRR N)				rface (F6)			☐ Very Shallow Dark Surface (TF12)						
Depleted E	Below Dark	Surface (A	· —					Other (Explain in Remarks)						
Thick Dark	s Surface (A12)		Redox Depress	, ,									
Sandy Mud MLRA 147	ck Mineral , 148)	(S1) (LRR N	١,	Iron-Manganes MLRA 136)	e Masses (F	-12) (LRR	N,							
Sandy Gle	yed Matrix	(S4)		Umbric Surface	e (F13) (ML	RA 136, 12	22)	3						
Sandy Rec	dox (S5)			Piedmont Floor	dplain Soils	(F19) (MLI	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and Irology must be present,					
Stripped M	1atrix (S6)			Red Parent Ma	terial (F21)	(MLRA 12	7, 147)		sturbed or problematic.					
Restrictive La	yer (if ob	served):												
Type:								Hydric Soil Present?	Yes ○ No ●					
Depth (inch	nes):							Tryunc 3011 Fresent:	res Uno U					
Remarks:														

Project/Site: Indiantown Ga	ap National Cemetery Expansi	on Project City	/County: East Hanover, L	ebanon Co.	Sampling D	ate: 08-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.		State: PA	Α	Sampling Point:	INC-W-012 (PEM)
Investigator(s): Bridger Th	ompson	Sec	ction, Township, Range: S	S	т	R
Landform (hillslope, terrace,	etc.): Gulch or Gully	Loca	l relief (concave, convex,	none):	concave Slope	e: _5.2 %/ 3.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	 Lat.: 40.4	12201072 Lo	- 0 ng.: -76.5	56113794	Datum: NAD-83
Soil Map Unit Name: CmB			12010/2		I classification: N/A	4
Are climatic/hydrologic cond	ditions on the site typical f	or this time of year?	Yes ○ No ● (If no	o, explain i	n Remarks.)	
Are Vegetation $\ \ \ \ \ \ $, So	il 🗌 , or Hydrology	significantly dis	turbed? Are "Norma	al Circumst	ances" present?	Yes 💿 No 🔾
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	il 🗌 , or Hydrology	naturally proble	matic? (If needed,	, explain an	ny answers in Remar	ks.)
Summary of Finding	gs - Attach site ma	p showing sam _l	pling point location	ns, tran	sects, importa	nt features, etc.
Hydrophytic Vegetation Pro		\supset				
Hydric Soil Present?	Yes No	\supset	Is the Sampled Area	Yes •	No O	
Wetland Hydrology Presen	_{t?} Yes 💿 No (\supset	within a Wetland?	103	110	
Remarks:						
Wetland data point collect surface water runoff from confluence into a heavily	an upslope maintained c	emetery grounds. The	area also contains multip	ple seasona		
Hydrology						
Wetland Hydrology Indicat	tors:			Secondar	y Indicators (minimum	of two required)
Primary Indicators (minim	um of one required; checl	k all that apply)		Surfac	ce Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plants (B14)	Spars	sely Vegetated Concave	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide Odor (C1)	Drain	age Patterns (B10)	
Saturation (A3)		Oxidized Rhizospheres al	long Living Roots (C3)	Moss	Trim Lines (B16)	
Water Marks (B1)		Presence of Reduced Iro	n (C4)	Dry S	eason Water Table (C2)	
Sediment Deposits (B2)		Recent Iron Reduction in	Tilled Soils (C6)	Crayfi	ish Burrows (C8)	
Drift deposits (B3)		Thin Muck Surface (C7)		Satura	ation Visible on Aerial In	magery (C9)
Algal Mat or Crust (B4)		Other (Explain in Remark	(s)	Stunt	ed or Stressed Plants (D	01)
Iron Deposits (B5)				Geom	norphic Position (D2)	
Inundation Visible on Aer	• , , ,			Shallo	ow Aquitard (D3)	
Water-Stained Leaves (B9	9)				topographic Relief (D4)	
Aquatic Fauna (B13)				FAC-r	neutral Test (D5)	
Field Observations:	Yes ○ No •	Depth (inches):				
Surface Water Present?	Yes O No •					
Water Table Present? Saturation Present?		Depth (inches):	Wetland Hyd	drology Pre	sent? Yes •	No O
(includes capillary fringe)	Yes No	Depth (inches):	0			
Describe Recorded Data (s	tream gauge, monitoring	well, aerial photos, pre	evious inspections), if ava	ailable:		
Remarks:						
The region is experiencing	very dry and drought like	conditions				
The region is experiencing	very dry and drought like	conditions.				

		Dominant		Sampling Point: <u>INC-W-012 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 1 (B)
4		0.0%		Species Across Air Structur.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: $\underline{100.0\%}$ (A/B)
6		0.0%		Dravalonae Index weekshooti
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:)		= Total Cover		OBL species $10 \times 1 = 10$
1	_	0.0%		FACW species $10 \times 2 = 20$
2		0.0%		FAC species $80 \times 3 = 240$
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
5	_	0.0%		Column Totals: 100 (A) 270 (B)
6		0.0%		Prevalence Index = B/A = 2,700
7		0.0%		Prevalence muex = b/A =
		0.0%		Hydrophytic Vegetation Indicators:
8				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
1	0	0.0%		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: 10 feet)		_		Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	80	80.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Scirpus atrovirens	10	10.0%	OBL	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Impatiens capensis	10	10.0%	FACW	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
5	0	0.0%		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).
		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				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:)	100	= 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 m)
2	0_	0.0%		in height.
3	0_	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%	_	l
6.	0	0.0%		Hydrophytic Vegetation
J	0	= Total Cove	·	Present? Yes No
			•	
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-012 (PEM)

Profile Descr	iption: (De		the depth	absence of indicators.)									
Depth	h Matrix Redox Features												
<u>(inches)</u>		(moist)		Color	(moist)	%	Type 1	Loc ²	Texture City Leaves	Rema	ırks		
0-6	10YR	4/3		-					Silt Loam				
6-12	10YR	4/1	_ 90	5YR	5/6	10	C	M	Silty Clay				
12-20	10YR	5/2	80	5YR	5/6	20	С	М	Clay Loam				
	-			-									
	-	-		-		-			-				
-	-	-		-	-			-	-				
1- 0.0								. 21					
			on. RM=Redi	uced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	ains ² Loca	ition: PL=Pore Lining. M=M	atrix			
Hydric Soil 1									Indicators for Probl	ematic Hydric	Soils ³ :		
Histosol (•				k Surface ((CO) (AALDA	1.47.1.40\	2 cm Muck (A10)	(MLRA 147)			
Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 147,148) Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148)						Coast Prairie Red	ox (A16)						
	nc (A3) n Sulfide (A4)	١						140)	(MLRA 147,148)				
	Layers (A5)	,			my Gleyed oleted Matri		1		Piedmont Floodp (MLRA 136, 147)				
		S N)				` '			_ `				
☐ 2 cm Muck (A10) (LRR N) ☐ Redox Dark Surface (F6) ☐ Depleted Below Dark Surface (A11) ☐ Depleted Dark Surface (F7)								☐ Very Shallow Dark Surface (TF12)					
Thick Dark Surface (A12) Redox Depressions (F8)							Other (Explain in	Remarks)					
	ıck Mineral (•	N.	_	•		F12) (LRR	N,					
MLRA 147	7, 148)	01) (1	-,		RA 136)								
Sandy Gle	eyed Matrix ((S4)		Um	bric Surface	e (F13) (ML	RA 136, 12	22)	3 7 - 12 - 1 - 1	hydrophytic veg	and a second		
Sandy Re	dox (S5)			Pied	dmont Floo	dplain Soils	(F19) (MLI	RA 148)	vetland hy	nyaropnytic veg drology must be	present,		
Stripped I	Matrix (S6)			Rec	l Parent Ma	terial (F21)	(MLRA 12	7, 147)	unless disturbed or problematic.				
Restrictive L	aver (if obs	served):											
Туре:													
Depth (inc	hes):								Hydric Soil Present?	Yes 💿	No O		
Remarks:													

Project/Site: Indiantown G	ap National Cemetery Ex	pansion Project	City/County: East Hanov	ver, Lebanon Co.	Sampling	Date: 08-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.		State	PA	Sampling Point:	INC-W-012 (UPL)
Investigator(s): Bridger Th	nompson		Section, Township, Rang	ge: S	т	R
Landform (hillslope, terrace	e, etc.): Gulch or G	ully	Local relief (concave, conv	vex, none):	concave Sid	ope:5.2_ % /3.0_ °
Subregion (LRR or MLRA):	MLRA 147 in LRR S		40.42177665	Long.: -76.5	6149774	Datum: NAD-83
Soil Map Unit Name: CmB	-Comly silt loam, 3 to	8 percent slopes		NWI	classification:	N/A
Are climatic/hydrologic con	ditions on the site typ	ical for this time of ye	ear? Yes O No 💿 (If no, explain in	Remarks.)	
Are Vegetation \Box , So				ormal Circumsta	•	Yes No
Are Vegetation \Box , So	oil , or Hydrolo				answers in Rem	arks.)
Summary of Findin			sampling point loca	tions, trans	ects, import	ant features, etc.
Hydrophytic Vegetation Pr		No •				
Hydric Soil Present?	Yes O	No •	Is the Sampled A within a Wetland		lo 💿	
Wetland Hydrology Presen	nt? Yes	No •	within a wetianu	ı f		
boundary.	ed to verify the wetter		a point is located in a in a	wooded area ap	sope and adjaces	ne to the weather
Hydrology						
Wetland Hydrology Indica	tors:			Secondary	Indicators (minimu	m of two required)
Primary Indicators (minim	num of one required;				e Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plant	• •		ly Vegetated Conca	ve Surface (B8)
High Water Table (A2)		Hydrogen Sulfide (` '		ge Patterns (B10)	
Saturation (A3)			eres along Living Roots (C3)		Frim Lines (B16)	
Water Marks (B1)		Presence of Reduc	` '		ason Water Table (0	C2)
Sediment Deposits (B2)			ction in Tilled Soils (C6)		h Burrows (C8)	
Drift deposits (B3)		☐ Thin Muck Surface	• •		tion Visible on Aeria	• , . ,
☐ Algal Mat or Crust (B4)		Other (Explain in F	Remarks)	_	d or Stressed Plants	(D1)
☐ Iron Deposits (B5)☐ Inundation Visible on Aer	rial Imagany (R7)				orphic Position (D2)	
Water-Stained Leaves (B					w Aquitard (D3)	.4\
Aquatic Fauna (B13)	9)				opographic Relief (D eutral Test (D5)	94)
Field Observations:				☐ FAC-III	eutrai Test (D5)	
Surface Water Present?	Yes O No 💿	Depth (inches):				
Water Table Present?	Yes O No 💿	Depth (inches):			_	_
Saturation Present?	Yes O No •	Depth (inches):	Wetland	l Hydrology Pres	$_{ m ient?}$ Yes \odot	No 💿
(includes capillary fringe)			ne provious inspections) if	f available.		
Describe Recorded Data (stream gauge, monito	ring weii, aeriai prioto	os, previous inspections), if	avallable:		
Remarks:						
The region is experiencing	yery dry and drough	t like conditions				
The region is experiencing	y very dry and drough	t like conditions.				

		Dominant		Sampling Point: <u>INC-W-012 (UPL)</u>
	Absolute % Cover		Indicator Status	Dominance Test worksheet:
1 Carya ovata	30	75.0%	FACU	Number of Dominant Species That are OBL, FACW, or FAC:
2. Juglans nigra	10	✓ 25.0%	FACU	Total Number of Dominant
3	0			Species Across All Strata:4 (B)
4	0			
5	0	0.0%		Percent of dominant Species That Are OBL, FACW, or FAC:25.0% (A/B)
6	0			That Are OBL, TACW, OF FAC.
7	0			Prevalence Index worksheet:
8	0	0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)	40	= Total Cove	er	OBL species
1	_	0.0%		FACW species 0 x 2 = 0
2		0.0%		FAC species $80 \times 3 = 240$
3	0	0.0%		FACU species $70 \times 4 = 280$
4	0	0.0%		UPL species $0 \times 5 = 0$
5	0	0.0%		Column Totals: <u>150</u> (A) <u>520</u> (B)
6	0	0.0%_		Prevalence Index = $B/A = 3.467$
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 feet)	_	= Total Cove	er	Morphological Adaptations ¹ (Provide supporting
1. Rosa multiflora	20	✓ 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	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	20	= Total Cove	er	of height.
1. Microstegium vimineum	80	✓ 88.9%	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. Solidago canadensis	10	11.1%	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	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0	0.0%		in height.
6	0	0.0%		Five Vegetation Strata:
7	0	0.0%		_
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).
10	0	0.0%		Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than
11	0	0.0%		3 in. (7.6 cm) DBH.
12	0	0.0%		Shrub stratum – Consists of woody plants, excluding woody
	90	= Total Cove	er	vines, approximately 3 to 20 ft (1 to 6 m) in height. 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 m)
2	0	0.0%_		in height.
3	0	0.0%_		Woody vines – Consists of all woody vines, regardless of
4		0.0%		height.
5	0	0.0%		Hydrophytic
6	0	0.0%		Vegetation No. 0
	0	= Total Cove	er	Present? Yes V NO V
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-012 (UPL)

Profile Descr		the depth				nfirm the a	absence of indicators.)	
Depth	Matrix			lox Featu	res 1			
(inches) 0-12	Color (moist)	100	Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks
	10YR 4/4		-	-			Silt Loam	
12-20	10YR 5/3	100					Silty Clay	
							-	
				-				
	-							
¹ Type: C=Con	centration. D=Depletic	n. RM=Redu	uced Matrix, CS=Covere	d or Coate	d Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I	Indicators:						Indicators for Broble	ematic Hydric Soils ³ :
Histosol (Dark Surface (S	57)				•
`	pedon (A2)		Polyvalue Belov		S8) (MLRA	147,148)	2 cm Muck (A10)	(MLRA 147)
☐ Black Hist			Thin Dark Surfa				Coast Prairie Red	ox (A16)
	Sulfide (A4)		Loamy Gleyed I			,	(MLRA 147,148)	
	Layers (A5)		Depleted Matrix				Piedmont Floodpl (MLRA 136, 147)	
	k (A10) (LRR N)		Redox Dark Sur				Very Shallow Dar	
	Below Dark Surface (A	.11)	Depleted Dark	Surface (F	7)		Other (Explain in	
	k Surface (A12)	,	Redox Depress					Kellidiks)
Sandy Mu	ıck Mineral (S1) (LRR N	١,	Iron-Manganes MLRA 136)	e Masses (F12) (LRR I	٧,		
MLRA 147			Umbric Surface	(F13) (MI	RΔ 136 12	2)		
	eyed Matrix (S4)						³ Indicators of	hydrophytic vegetation and
Sandy Re			Piedmont Floor				wetland hyd	drology must be present,
Stripped i	Matrix (S6)		Red Parent Mai	eriai (F21)	(MLRA 12)	⁷ , 147)	uniess di	sturbed or problematic.
Restrictive L	ayer (if observed):							
Туре:							Under Call Bos and	Yes ○ No •
Depth (incl	hes):						Hydric Soil Present?	Yes ○ No •
Remarks:								
1								

Project/Site: Indiantown Gap National Cemetery I	Expansion Project C	ity/County: East Hanover, Le	banon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Associates, Inc.		State: PA	
Investigator(s): Bridger Thompson	5	Section, Township, Range: S	TR
Landform (hillslope, terrace, etc.): Hillside	Lo	cal relief (concave, convex, n	one): concave Slope: 3.5 % / 2.0 °
Subregion (LRR or MLRA): MLRA 147 in LRR	_		g: -76.56027776
Soil Map Unit Name: CmB-Comly silt loam, 3 t		J.4231220/	NWI classification: N/A
Are climatic/hydrologic conditions on the site ty	pical for this time of year?	? Yes ○ No ● (If no,	explain in Remarks.)
Are Vegetation, Soil, or Hydro	ology	disturbed? Are "Normal	Circumstances" present? Yes ● No ○
Are Vegetation $\ \square$, Soil $\ \square$, or Hydro	ology 🔲 naturally prob	olematic? (If needed,	explain any answers in Remarks.)
Summary of Findings - Attach site	e map showing sar	mpling point location	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes •	No O		
Hydric Soil Present? Yes ●	No O	Is the Sampled Area	Yes ● No ○
Wetland Hydrology Present? Yes •	No O	within a Wetland?	TES © INU C
Remarks:			
from an upslope maintenance area. The wetl	and boundary is defined b	y the slight topography and i	the Saturated fow Chroma redux Sons.
Hydrology		<u></u>	
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one required			Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plants (B	•	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Odo	• •	Drainage Patterns (B10)
✓ Saturation (A3)		s along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduced	• •	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction	• ,	Crayfish Burrows (C8)
Drift deposits (B3)	☐ Thin Muck Surface (C7	•	Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)☐ Iron Deposits (B5)	U Other (Explain in Rem	arks)	Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)			Geomorphic Position (D2) Shallow Aquitard (D3)
Water-Stained Leaves (B9)			Microtopographic Relief (D4)
Aquatic Fauna (B13)			FAC-neutral Test (D5)
Field Observations:			The reductive (55)
Surface Water Present? Yes O No •	Depth (inches):		
Water Table Present? Yes O No •	Depth (inches):		
Saturation Present? (includes capillary frings) Yes No	Depth (inches):	Wetland Hydi	ology Present? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monit			lahle:
Describe recorded sata (see sam gaage,	Johns Wen, dend. p. Sec.,	previous inspections,, i. a. a	ubic.
Remarks:			
The region is experiencing very dry and droug	tht like conditions.		

		Dominant Species?		Sampling Point: <u>INC-W-013 (PEM)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 1 (B)
4.	_	0.0%		Species Across Air Strata.
5		0.0%		Percent of dominant Species
		0.0%		That Are OBL, FACW, or FAC: 100.0% (A/B)
6		0.0%		Dravalonae Index weekshooti
7				Prevalence Index worksheet: Total % Cover of: Multiply by:
8		0.0%		
Sapling-Sapling/Shrub Stratum (Plot size:)	:	= Total Cover		OBL species $0 \times 1 = 0$
1	_	0.0%		FACW species $20 \times 2 = 40$
2		0.0%		FAC species $80 \times 3 = 240$
3		0.0%		FACU species $0 \times 4 = 0$
4	_	0.0%		UPL species $0 \times 5 = 0$
5		0.0%		Column Totals: 100 (A) 280 (B)
6		0.0%		Dravalance Index D/A 2 000
7		0.0%		Prevalence Index = B/A = 2.800
		0.0%		Hydrophytic Vegetation Indicators:
8		\neg		Rapid Test for Hydrophytic Vegetation
9				✓ Dominance Test is > 50%
10	_	0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)	:	= Total Cover		$igcap$ 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	0.0%		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: 10 feet)		_		Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	80	80.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Impatiens capensis	10	10.0%	FACW	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Onoclea sensibilis	10	10.0%	FACW	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 in height.
5	0_	0.0%		in neight.
6	0_	0.0%		Five Vegetation Strata:
7	0	0.0%		
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).
		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
		= Total Cover		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 species, except woody vines, less than approximately 3 ft (1 m)
2	0	0.0%		in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%		Hodoobodia
6.	0	0.0%		Hydrophytic Vegetation
	0	= Total Cove	·	Present? Yes No
Demontos (Include abote acceptant				I
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC-W-013 (PEM)

Profile Descr			the depth	needed to				nfirm the a	absence of indicators.)		
Depth		Matrix				dox Featu	res 1				
(inches)	Color (n			Color	(moist)	%	Type 1	Loc ²	Texture	Remarks	
0-4		4/3	_ 100						Silt Loam		
4-12	2.5Y	4/2	_ 90	5YR	5/6	10	C	M	Silty Clay		
12-20	2.5YR	5/3	80	5YR	5/6	20	С	М	Clay Loam		
									-		
			-	-		-			-		
-			_	-	-		-		-		
1											
		=Depletic	on. RM=Red	uced Matrix,	CS=Covere	ed or Coate	ed Sand Gra	ains ² Loca	ation: PL=Pore Lining. M=M	atrix	
Hydric Soil 1									Indicators for Proble	ematic Hydric Soils ³ :	
Histosol (•				k Surface (CO) (141 D.4	4.47.4.40\	2 cm Muck (A10)	(MLRA 147)	
	pedon (A2)				value Belov				Coast Prairie Red	ox (A16)	
Black Hist	Sulfide (A4)				n Dark Surf			148)	(MLRA 147,148)		
	Layers (A5)				my Gleyed oleted Matri				Piedmont Floodpl (MLRA 136, 147)	ain Soils (F19)	
	k (A10) (LRR I	N)			lox Dark Su	. ,				Confron (TE12)	
	Below Dark Su		(11)		leted Dark	. ,	7)		☐ Very Shallow Dar		
	k Surface (A12	•	111)		lox Depress		,		U Other (Explain in	Remarks)	
	ıck Mineral (S1	•	٧.	Iror	n-Manganes	e Masses (F12) (LRR	N,			
MLRA 147	7, 148)	-, (-,		RA 136)						
Sandy Gle	eyed Matrix (S	4)		Um	bric Surface	e (F13) (ML	.RA 136, 12	22)	3		
Sandy Re	dox (S5)						(F19) (ML	RA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,		
Stripped I	Matrix (S6)			Rec	l Parent Ma	terial (F21)	(MLRA 12	7, 147)	unless di	sturbed or problematic.	
Restrictive L	ayer (if obse	rved):									
Туре:											
Depth (inc	hes):								Hydric Soil Present?	Yes No	
Remarks:											

Project/Site: Indiantown Gap National Cemetery Expansion Project	City/County: East Hanover, Lebanon Co. Sampling Date: 08-Oct-20
Applicant/Owner: Mabbett & Associates, Inc.	State: PA Sampling Point: INC-W-013 (UPL)
Investigator(s): Bridger Thompson	Section, Township, Range: S T R
Landform (hillslope, terrace, etc.): Hillside	Local relief (concave, convex, none): Concave Slope: 7.0 % / 4.0 °
Subregion (LRR or MLRA): MLRA 147 in LRR S	Lat.: 40.42316726 Long.: -76.56034244 Datum:
Soil Map Unit Name: CmB-Comly silt loam, 3 to 8 percent slope	7,0000001211
Are climatic/hydrologic conditions on the site typical for this time	
	ficantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation 🔲 , Soil 🗌 , or Hydrology 🔲 natu	rally problematic? (If needed, explain any answers in Remarks.)
Summary of Findings - Attach site map showi	ng sampling point locations, 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?
Remarks:	
downslope of a maintenance area.	
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one required; check all that ap	Oply) Surface Soil Cracks (B6)
Surface Water (A1)	c Plants (B14) Sparsely Vegetated Concave Surface (B8)
Hydrogen St	ulfide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rh	izospheres along Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of	Reduced Iron (C4)
Sediment Deposits (B2)	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift deposits (B3)	Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Expla	in 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 (inc	
	, <u> </u>
Water Table Present? Yes No Depth (inc	hes): Wetland Hydrology Present? Yes O No •
(includes capillary fringe) Yes No Depth (includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspections), if available:
Remarks:	
The region is experiencing very dry and drought like conditions	

	Absolute % Cover	Re Co		Indicator Status	Dominance Test worksheet:
1. Juglans nigra			ver	Status	
	20				Number of Dominant Species
2		✓,	100.0%	FACU	That are OBL, FACW, or FAC:1 (A)
2	0	\square	0.0%		Total Number of Dominant
3	0		0.0%		Species Across All Strata:5(B)
4	0		0.0%		
5			0.0%		Percent of dominant Species
6			0.0%		That Are OBL, FACW, or FAC: 20.0% (A/B)
7			0.0%		Prevalence Index worksheet:
8	0	\Box	0.0%		Total % Cover of: Multiply by:
	20	 = To	tal Cover		OBL species 0 x 1 = 0
Sapling-Sapling/Shrub Stratum (Plot size:)					FACW species $0 \times 2 = 0$
1	0		0.0%		
2	0		0.0%		FAC species $80 \times 3 = 240$
3	0		0.0%		FACU species $40 \times 4 = 160$
4	•		0.0%		UPL species $30 \times 5 = 150$
5			0.0%		Column Totals: <u>150</u> (A) <u>550</u> (B)
6.	_		0.0%		Prevalence Index = B/A = 3.667
		\Box	0.0%		<u> </u>
7		\Box	0.0%		Hydrophytic Vegetation Indicators:
8		\Box	0.0%		Rapid Test for Hydrophytic Vegetation
9					☐ Dominance Test is > 50%
10		Ш.	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)		= To	tal Cover		Morphological Adaptations ¹ (Provide supporting
1. Elaeagnus umbellata	30	✓,	60.0%	UPL	data in Remarks or on a separate sheet)
2. Rosa multiflora	10	V	20.0%	FACU	☐ Problematic Hydrophytic Vegetation ¹ (Explain)
3. Lonicera tatarica	10	V	20.0%	FACU	¹ 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:
		\Box	0.0%		Four Vegetation Strata:
6					Tree stratum – Consists of woody plants, excluding vines, 3 in.
7		<u> </u>	0.0%		(7.6 cm) or more in diameter at breast height (DBH), regardless
Herb Stratum (Plot size: 10 feet)	50	= 10	tal Cover		of height. Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	80	✓,	100.0%	FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2	0		0.0%		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		0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0		0.0%		in height.
6	0		0.0%		Fire Wasshallow Churcher
7	0		0.0%		Five Vegetation Strata:
8	0	\Box	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
	0		0.0%		diameter at breast height (DBH).
9		Η.			Sapling stratum – Consists of woody plants, excluding woody
0		一.	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1	0	Η.	0.0%		Shrub stratum – Consists of woody plants, excluding woody
2	0	Ш.	0.0%		vines, approximately 3 to 20 ft (1 to 6 m) in height.
Woody Vine Stratum (Plot size:)	80	= 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
	0	\Box	0.0%		height.
4	0		0.0%		
5					Hydrophytic
6		Щ.	0.0%		Vegetation Present? Yes ○ No ●
	0	= To	otal Cove	·	

Soil Sampling Point: INC-W-013 (UPL)

Profile Descr		the depth				nfirm the a	absence of indicators.)	
Depth	Matrix			lox Featu	<u>res</u> 1			
(inches) 0-12	Color (moist) 10YR 4/4	%	Color (moist)	<u></u> %	Type 1	Loc²	<u>Texture</u> Silt Loam	Remarks
			-					
12-20	10YR 5/3	100					Clay Loam	
		-			-			
	-						-	
		on. RM=Redu	uced Matrix, CS=Covere	d or Coate	ed Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I							Indicators for Proble	ematic Hydric Soils ³ :
Histosol (,		Dark Surface (S				2 cm Muck (A10)	(MLRA 147)
	pedon (A2)		Polyvalue Belov				Coast Prairie Redo	
☐ Black Hist			☐ Thin Dark Surfa			148)	(MLRA 147,148)	
	Sulfide (A4)		Loamy Gleyed I)		Piedmont Floodpl	ain Soils (F19)
	Layers (A5)		Depleted Matrix Redox Dark Sur				(MLRA 136, 147)	
	k (A10) (LRR N)	144	Depleted Dark Sur	٠,	7)		☐ Very Shallow Dark	
	Below Dark Surface (A k Surface (A12)	A11)	Redox Depressi		,)		Other (Explain in	Remarks)
	` '	M	☐ Iron-Manganes		F12) (LRR	N.		
MLRA 147	ick Mineral (S1) (LRR I 7, 148)	ν,	MLRA 136)	2 1 105505 (112) (2141)	,		
Sandy Gle	eyed Matrix (S4)		Umbric Surface	(F13) (ML	RA 136, 12	22)	3	
Sandy Re	dox (S5)		Piedmont Flood	plain Soils	(F19) (MLI	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and Irology must be present,
Stripped N	Matrix (S6)		Red Parent Mat	erial (F21)	(MLRA 12	7, 147)		sturbed or problematic.
Restrictive L	ayer (if observed):							
Type:	-, (,-							
Depth (inc	hes):						Hydric Soil Present?	Yes O No 💿
Remarks:								
1								

Project/Site: Indiantown G	ap National Cemetery Exp	pansion Project	City/County:	East Hanover, Le	banon Co.	Sampling D	Date: 08-Oct-20
Applicant/Owner: Mabbett	& Associates, Inc.			State: PA		Sampling Point:	INC-W-015 (PEM)
Investigator(s): Bridger Th	nompson		Section, Town	nship, Range: S		т	R
Landform (hillslope, terrace	, etc.): Channel (ad	ctive)	Local relief (co	ncave, convex, n	one):	concave Slop	e: <u>10.5</u> %/ 6.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.:	40.425976	Lon	ı g.: -76.	 556871	Datum: NAD-83
Soil Map Unit Name: BkD-						/I classification: N/	_
Are climatic/hydrologic con	ditions on the site typ	ical for this time of ye	ar? Yes 🔾	No 🍑 (If no,	explain i	in Remarks.)	
Are Vegetation $\ \ \ \ $, So	il 🗌 , or Hydrolo	gy 🗌 significanti	ly disturbed?	Are "Normal	Circums	tances" present?	Yes No
Are Vegetation $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	il 🗌 , or Hydrolo	gy 🗌 naturally p	roblematic?	(If needed, e	explain a	ny answers in Remar	ks.)
Summary of Finding	gs - Attach site	map showing s	ampling po	int location	s, trar	sects, importa	nt features, etc.
Hydrophytic Vegetation Pr		No O					
Hydric Soil Present?	Yes 💿	No O		Sampled Area	Yes •	No O	
Wetland Hydrology Presen	_{t?} Yes 💿	No O	within	a Wetland?	103	110	
Remarks:			-				
Wetland data point collec contains a small intermitt The wetland boundary is	ent channel. The wetl	and is associated with	n a narrow flood	dplain for the cha	annel and		
Hydrology							
Wetland Hydrology Indica	tors:				Seconda	ry Indicators (minimum	of two required)
Primary Indicators (minim	num of one required; o	check all that apply)			Surfa	ace Soil Cracks (B6)	
Surface Water (A1)		True Aquatic Plants	s (B14)		Span	sely Vegetated Concave	Surface (B8)
High Water Table (A2)		Hydrogen Sulfide C	Odor (C1)		Drair	nage Patterns (B10)	
Saturation (A3)		Oxidized Rhizosphe	eres along Living F	Roots (C3)	Moss	Trim Lines (B16)	
Water Marks (B1)		Presence of Reduce	ed Iron (C4)		Dry S	Season Water Table (C2)
Sediment Deposits (B2)		Recent Iron Reduct	tion in Tilled Soils	(C6)	Cray	fish Burrows (C8)	
Drift deposits (B3)		☐ Thin Muck Surface	(C7)		Satu	ration Visible on Aerial I	magery (C9)
Algal Mat or Crust (B4)		Other (Explain in R	emarks)		Stun	ted or Stressed Plants (I	D1)
Iron Deposits (B5)					Geor	morphic Position (D2)	
Inundation Visible on Aer	ial Imagery (B7)				Shall	ow Aquitard (D3)	
Water-Stained Leaves (B	9)				Micro	otopographic Relief (D4))
Aquatic Fauna (B13)					FAC-	neutral Test (D5)	
Field Observations:	V O N- O						
Surface Water Present?	Yes O No O	Depth (inches):					
Water Table Present?	Yes ○ No •	Depth (inches):		W-11 1 111-		esent? Yes •	No O
Saturation Present? (includes capillary fringe)	Yes No	Depth (inches):	0	Wetland Hydr	ology Pro	esent? Tes 💌	NO U
Describe Recorded Data (s	stream gauge, monito	ring well, aerial photo	s, previous insp	ections), if avail	able:		
Remarks:							
		. 191					
The region is experiencing	very ary and drough	: like conditions.					

Tree Stratum (Plot size:	Number of Dominant Species That are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: 1 (A)
2.	That are OBL, FACW, or FAC: (A) Total Number of Dominant
3.	
3.	
4.	
6.	•
6	Percent of dominant Species That Are OBL FACW or FAC: 100.0% (A/B)
8.	That Are OBL, FACW, or FAC: 100.0% (A/B)
Sapling-Sapling/Shrub Stratum (Plot size:	Prevalence Index worksheet:
Sapling-Sapling/Shrub Stratum (Plot size:	Total % Cover of: Multiply by:
1	OBL species
2.	FACW species $\underline{10}$ x 2 = $\underline{20}$
3.	FAC species $80 \times 3 = 240$
4.	FACU species $10 \times 4 = 40$
5.	UPL species $0 \times 5 = 0$
6.	Column Totals: 100 (A) 300 (B)
8.	Prevalence Index = B/A = 3.000
8.	, , , , , , , , , , , , , , , , , , , ,
9.	Hydrophytic Vegetation Indicators: Rapid Test for Hydrophytic Vegetation
O.	
Shrub Stratum (Plot size:	Dominance Test is > 50% ✓ Prevalence Index is ≤ 3.0 ¹
1.	
2.	Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
3.	Problematic Hydrophytic Vegetation ¹ (Explain)
4.	
5. 0 0.0% 6. 0 0.0% 7. 0 0.0% Herb Stratum (Plot size: 10 feet) 0 = Total Cover 1. Microsteglum vimineum 80 ✓ 80.0% 1 2. Onoclea sensibilis 10 10.0% 1 3. Festuca rubra 10 10.0% 1 4. 0 0.0% 5 5. 0 0.0% 0 6. 0 0.0% 0 7. 0 0.0% 0 8. 0 0.0% 0 9. 0 0.0% 0 10. 0 0.0% 0 1. 0 0.0% 0 2. 0 0.0% 0 3. Festuca rubra 0 0.0% 6. 0 0.0% 0 9. 0 0.0% 0 10. 0 0.0% 0 10. 0 0.0% 0 10. 0 0 <td>1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</td>	1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6.	Definition of Vegetation Strata:
7. 0 0.0% Herb Stratum (Plot size: 10 feet) 0 = Total Cover 1. Microsteglum vimineum 80 ✓ 80.0% 1 2. Onoclea sensibilis 10 10.0% 1 3. Festuca rubra 10 10.0% 1 4. 0 0.0% 6 5. 0 0.0% 0 6. 0 0.0% 0 7. 0 0.0% 0 8. 0 0.0% 0 9. 0 0.0% 0 10. 0 0.0% 0 11. 0 0.0% 0 12. 0 0.0% 0 Woody Vine Stratum (Plot size:) 0 0.0% 1. 0 0.0% 0 0	Four Vegetation Strata:
Herb Stratum (Plot size: 10 feet)	Tree stratum – Consists of woody plants, excluding vines, 3 in.
Merb Stratum (Flot size: loteet) 1. Microstegium vimineum 80 ✓ 80.0% 2. Onoclea sensibilis 10 10.0% 3. Festuca rubra 10 10.0% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 11. 0 0.0% 12. 0 0.0% Woody Vine Stratum (Plot size:) 100 = Total Cover 1. 0 0.0%	(7.6 cm) or more in diameter at breast height (DBH), regardless
2. Onoclea sensibilis 10 10.0% 3. Festuca rubra 10 10.0% 4. 0 0.0% 5. 0 0.0% 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 1. 0 0.0% 2. 0 0.0% Woody Vine Stratum (Plot size:) 100 = Total Cover 1. 0 0.0%	of height. Sapling/shrub stratum – Consists of woody plants, excluding
3. Festuca rubra 4	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
4.	Herb stratum – Consists of all herbaceous (non-woody) plants,
5.	regardless of size, and all other plants less than 3.28 ft tall.
6.	Woody vines – Consists of all woody vines greater than 3.28 ft in height.
7.	
8. 0 0.0% 9. 0 0.0% 1. 0 0.0% 2. 0 0.0% Woody Vine Stratum (Plot size:) 100 = Total Cover 1. 0 0.0%	Five Vegetation Strata:
9.	Tree - Woody plants, excluding woody vines, approximately 20
0.	ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
1.	Sapling stratum – Consists of woody plants, excluding woody
2	vines, approximately 20 ft (6 m) or more in height and less than
Woody Vine Stratum (Plot size:	3 in. (7.6 cm) DBH.
1	Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
1	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)
L	in height.
3. 0 0 0.0%	Woody vines – Consists of all woody vines, regardless of
4	height.
5. 0 0.0%	
6. 0 0.0%	Hydrophytic Vegetation
0 = Total Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate sheet.)	

Soil Sampling Point: INC-W-015 (PEM)

Profile Desci		tile deptil	needed to do	cument t	he indic	ator or co	nfirm the a	absence of indicators.)	
Depth	Matrix				x Featu	res			
<u>(inches)</u>	Color (moist)	%	Color (m	ioist)	%	Type 1	Loc²	Texture	Remarks
0-6	10YR 4/3	_ 100						Silt Loam	
6-14	10YR 4/2	90	5YR	5/6	10	C	M	Silty Clay	
14-20	10YR 5/2	90	5YR	5/6	10	С	М	Clay Loam	
	-								
								-	
					-			-	
1									
		on. RM=Red	uced Matrix, CS	S=Covered	or Coate	d Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=Ma	atrix
Hydric Soil 1								Indicators for Proble	matic Hydric Soils ³ :
Histosol (•			Surface (S7		CO) (141 D.4	4.47.4.40\	2 cm Muck (A10)	(MLRA 147)
	pedon (A2)					S8) (MLRA		Coast Prairie Redo	x (A16)
Black Hist	n Sulfide (A4)					LRA 147, 1	48)	(MLRA 147,148)	
	Layers (A5)		✓ Deplet	Gleyed Matrix				Piedmont Floodpla (MLRA 136, 147)	ain Soils (F19)
	k (A10) (LRR N)			Dark Surfa	. ,				Conform (TE12)
	Below Dark Surface (A	111)		ed Dark Su	. ,	')		☐ Very Shallow Dark	
	k Surface (A12)	111)		Depressio		,		Other (Explain in	Remarks)
	ıck Mineral (S1) (LRR	N.	☐ Iron-M	langanese	Masses (F12) (LRR I	١,		
MLRA 147	7, 148)	•••	MLRA	-					
Sandy Gle	eyed Matrix (S4)		Umbri	c Surface (F13) (ML	RA 136, 12	2)	3 7	hydrophytic vegetation and
Sandy Re	dox (S5)	Piedmont Floodplain Soils (F19) (MLRA 148)				A 148)	wetland hyd	rology must be present,	
Stripped I	Matrix (S6)		Red Pa	arent Mate	rial (F21)	(MLRA 127	', 147)	unless dis	sturbed or problematic.
Restrictive L	ayer (if observed):								
Туре:									
Depth (inc	hes):							Hydric Soil Present?	Yes No
Remarks:								1	

Project/Site: Indiantown Gap	National Cemetery Expan	sion Project	City/County:	East Hanover, Le	ebanon Co	Sampling	Date: 08-Oct-20
Applicant/Owner: Mabbett &	Associates, Inc.			State: PA		Sampling Point:	INC_W-015 (UPL)
Investigator(s): Bridger Thor	npson		Section, Town	ship, Range: S		т	R
Landform (hillslope, terrace, e	tc.): Toeslope		ocal relief (con	cave, convex, n	none):	concave Slo	pe: _36.4 % / 20.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S		40.426018	Lor	na : -76	5.556949	Datum: NAD-83
Soil Map Unit Name: BkD-Be						NI classification: N	
· · · · · · · · · · · · · · · · · · ·	· ·			u ₁			<u> </u>
Are climatic/hydrologic condi				` '		in Remarks.)	Yes ● No ○
Are Vegetation, Soil	, or Hydrology	significantly	disturbed?	Are "Normal	l Circum:	stances" present?	res © NO C
Are Vegetation, Soil	, or Hydrology	naturally pro	oblematic?	(If needed,	explain a	any answers in Rema	rks.)
Summary of Findings	s - Attach site m	ap showing sa	mpling po	int location	ıs, tra	nsects, importa	ant features, etc.
Hydrophytic Vegetation Pres	ent? Yes O No	, •					
Hydric Soil Present?	Yes O No	•	Is the	Sampled Area	V (No 💿	
Wetland Hydrology Present?	Yes O No	•		a Wetland?	res \smile	NO S	
Remarks:							
Upland data point collected maintained transmission line	,	ooundary. The data	point is located	d on a steep hill	Islope ac	ljacent to the wetlan	d in periodically
Hydrology							
Wetland Hydrology Indicato	rs:				Seconda	ary Indicators (minimum	of two required)
Primary Indicators (minimus	m of one required; che		(D14)		Sur	face Soil Cracks (B6)	
Surface Water (A1) High Water Table (A2)		☐ True Aquatic Plants (☐ Hydrogen Sulfide Od	-			rsely Vegetated Concav inage Patterns (B10)	e Surface (B8)
Saturation (A3)		Oxidized Rhizospher	. ,	oots (C3)		ss Trim Lines (B16)	
Water Marks (B1)		Presence of Reduced		(65)		Season Water Table (C	2)
Sediment Deposits (B2)		Recent Iron Reduction	. ,	(C6)		yfish Burrows (C8)	-,
Drift deposits (B3)		Thin Muck Surface (` ,		uration Visible on Aerial	Imagery (C9)
Algal Mat or Crust (B4)		Other (Explain in Re	*		Stu	nted or Stressed Plants	(D1)
☐ Iron Deposits (B5)	_	(,		Geo	morphic Position (D2)	
☐ Inundation Visible on Aerial	Imagery (B7)				Sha	llow Aquitard (D3)	
☐ Water-Stained Leaves (B9)					Mic	rotopographic Relief (D4	()
Aquatic Fauna (B13)					FAC	C-neutral Test (D5)	
Field Observations:	0 0						
	Yes ○ No •	Depth (inches):					
Water Table Present?	Yes O No 💿	Depth (inches):					🕤
Saturation Present?	Yes O No 💿	Depth (inches):		Wetland Hydi	rology P	resent? Yes	No •
(includes capillary fringe) Describe Recorded Data (str	eam gauge, monitoring	g well, aerial photos	, previous insp	ections), if avai	lable:		
Remarks:							
The region is experiencing v	ery dry and drought lik	ce conditions.					

		Dominant Species?		Sampling Point: <u>INC_W-015 (UPL)</u>
Tree Stratum (Plot size:)	Absolute % Cover		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: 4 (B)
4.	_	0.0%		Species Across Air Strata.
••		0.0%		Percent of dominant Species
5		0.0%		That Are OBL, FACW, or FAC:50.0% (A/B)
6		0.0%		Burnel and Tarker to the state of
7				Prevalence Index worksheet:
8		0.0%		Total % Cover of: Multiply by:
Sapling-Sapling/Shrub Stratum (Plot size:)		= Total Cover		OBL species 0 x 1 = 0
1	_	0.0%		FACW species $0 \times 2 = 0$
2		0.0%		FAC species $70 \times 3 = 210$
3		0.0%		FACU species $40 \times 4 = 160$
4	_	0.0%		UPL species $0 \times 5 = 0$
•••		0.0%		Column Totals: 110 (A) 370 (B)
5		0.0%		
6		0.0%		Prevalence Index = B/A = 3.364
7				Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9				☐ Dominance Test is > 50%
10	0	0.0%		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)		= Total Cover		Morphological Adaptations ¹ (Provide supporting
1. Rubus idaeus	10	✓ 50.0%	FAC	data in Remarks or on a separate sheet)
2. Lonicera japonica	10	50.0%	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
3.		0.0%		¹ Indicators of hydric soil and wetland hydrology must
		0.0%		be present, unless disturbed or problematic.
4		0.0%		Definition of Vegetation Strata:
5				Four Vegetation Strata:
6				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), regardless
Herb Stratum (Plot size: 10 feet)	20	= Total Cover		of height.
1. Microstegium vimineum	_60	⋖ 60.0%	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. Solidago canadensis	10	10.0%	FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,
3. Festuca rubra	20	20.0%	FACU	regardless of size, and all other plants less than 3.28 ft tall.
4	10	10.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
5	0	0.0%		in height.
6	0	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		0.0%		vines, approximately 20 ft (6 m) or more in height and less than
11				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.
	100	= 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 m)
2	0	0.0%		in height.
3	0	0.0%		Woody vines – Consists of all woody vines, regardless of
4	0	0.0%		height.
5	0	0.0%	_	l
6.	0	0.0%		Hydrophytic Vegetation
J.,	0	= Total Cove		Present? Yes No •
Remarks: (Include photo numbers here or on a separate shee	et.)			

Soil Sampling Point: INC_W-015 (UPL)

Profile Descri	iption: (Describe	to the depth	needed to document	the indica	ator or co	nfirm the a	absence of indicators.)		
Depth	Matrix	к	Red	lox Featu					
(inches)	Color (moist)		Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks	
0-10	10YR 4/3	100					Silt Loam		
10-20	10YR 5/3	100					Silty Clay		
							-		
							-		
¹ Type: C=Cond	centration. D=Deple	tion. RM=Redu	iced Matrix, CS=Covere	d or Coated	d Sand Gra	ins ² Locat	tion: PL=Pore Lining. M=M	atrix	
Hydric Soil I	ndicators:						Indicators for Proble	ematic Hydric Soils ³ :	
Histosol (A	A1)		Dark Surface (S	67)			2 cm Muck (A10)		
	pedon (A2)		Polyvalue Belov	•	, ,		Coast Prairie Red	` ,	
Black Histi	,		Thin Dark Surfa	ice (S9) (MI	LRA 147, 1	.48)	(MLRA 147,148)	DX (A16)	
	Sulfide (A4)		Loamy Gleyed I				Piedmont Floodpl	ain Soils (F19)	
	Layers (A5)		Depleted Matrix				(MLRA 136, 147)	• ,	
	k (A10) (LRR N)		Redox Dark Surface (F6)				☐ Very Shallow Dark Surface (TF12)		
	Below Dark Surface	(A11)	Depleted Dark)		Other (Explain in	Remarks)	
	k Surface (A12)		Redox Depress	. ,	-12) (LDD				
Sandy Mud MLRA 147	ck Mineral (S1) (LRF ', 148)	R N,	☐ Iron-Manganes MLRA 136)						
Sandy Gle	yed Matrix (S4)		Umbric Surface	(F13) (MLI	RA 136, 12	.2)	³ Indicators of hydrophytic vegetation and		
Sandy Rec	dox (S5)		☐ Piedmont Flood	lplain Soils	(F19) (MLI	RA 148)	wetland hyd	nyaropnytic vegetation and Irology must be present,	
Stripped M	Matrix (S6)		Red Parent Ma	erial (F21)	(MLRA 12	7, 147)	unless di	sturbed or problematic.	
Restrictive La	ayer (if observed)	:							
Type:							Undria Call Dusanut?	Yes O No O	
Depth (inch	nes):						Hydric Soil Present?	Yes ○ No •	
Remarks:									

Project/Site: Indiantown Gap National C	Cemetery Expansion Project	City/County: East Hanover, L	.ebanon Co. Sampling Date: 28-Apr-21
Applicant/Owner: Mabbett & Associates	s, Inc.	State: P.	
Investigator(s): Bridger Thompson	<u> </u>	Section, Township, Range: \$	
	Floodplain	Local relief (concave, convex,	none): concave Slope: 8.7 % / 5.0 °
_	- · · · ·	, ,	<u> </u>
	17 in LRR S Lat.:		ong.: -76.557350°
Soil Map Unit Name: WeD-Weikert ch		0 0	NWI classification: R4SBC
Are climatic/hydrologic conditions on t	he site typical for this time of ye	ar? Yes 🏵 No 🔾 (If no	o, explain in Remarks.)
Are Vegetation $igsqcup$, Soil $igsqcup$,	or Hydrology Significantl	ly disturbed? Are "Norma	al Circumstances" present? Yes No
Are Vegetation $\ \square$, Soil $\ \square$,	or Hydrology 🔲 naturally p	roblematic? (If needed,	, explain any answers in Remarks.)
		ampling point locatio	ns, transects, important features, etc.
7 7	Yes No		
Hydric Soil Present?	Yes No	Is the Sampled Area	Yes No
Wetland Hydrology Present?	Yes No	within a Wetland?	ies o no o
Remarks: Wetland data point collected to docu watercourse. The wetland boundary			along the floodplain of a small perennial
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one	required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plants	s (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide C	Odor (C1)	✓ Drainage Patterns (B10)
Saturation (A3)	Oxidized Rhizosphe	eres along Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduce	ed Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduct	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)			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):		
<u> </u>			
	2 op a. (e.).	Wetland Hyd	drology Present? Yes No
Saturation Present? (includes capillary fringe) Yes	No Depth (inches):	0	arology i resent:
Describe Recorded Data (stream gauge	ge, monitoring well, aerial photo	s, previous inspections), if ava	ailable:
Remarks:			

Tree Stratum	ute ver [Rei		Indicator Status	Dominance Test worksheet: Number of Dominant Species 3 (A) Total Number of Dominant 4 (B) Species Across All Strata: 4 (B) Percent of dominant Species 75.0% (A/B) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 30 x 1 = 30 FACW species 0 x 2 = 0 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 0 x 5 = 0 Column Totals: 80 (A) 190 (B)
2.		Tot	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% tal Cover 0.0% 0.0% 0.0%		That are OBL, FACW, or FAC:3
3.		Tot	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 30 x 1 = 30 FACW species 0 x 2 = 0 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 0 x 5 = 0
3.		Tot	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 30 x 1 = 30 FACW species 0 x 2 = 0 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 0 x 5 = 0
4		Tot	0.0% 0.0% 0.0% 0.0% tal Cover 0.0% 0.0% 0.0% 0.0%		That Are OBL, FACW, or FAC: 75.0% (A/B) Prevalence Index worksheet:
6		Tot	0.0% 0.0% 0.0% tal Cover 0.0% 0.0% 0.0% 0.0%		That Are OBL, FACW, or FAC: 75.0% (A/B) Prevalence Index worksheet:
7		Tot	0.0% 0.0% tal Cover 0.0% 0.0% 0.0% 0.0%		Prevalence Index worksheet:
8		Tot	0.0% tal Cover 0.0% 0.0% 0.0% 0.0%		Total % Cover of: Multiply by: OBL species 30 x 1 = 30 FACW species 0 x 2 = 0 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 0 x 5 = 0
Sapling-Sapling/Shrub Stratum (Plot size:		Tot	0.0% 0.0% 0.0% 0.0% 0.0%		OBL species 30 x 1 = 30 FACW species 0 x 2 = 0 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 0 x 5 = 0
Sapling-Sapling/Shrub Stratum (Plot size:		Tot	0.0% 0.0% 0.0% 0.0% 0.0%		FACW species 0 $x 2 = 0$ FAC species 40 $x 3 = 120$ FACU species 10 $x 4 = 40$ UPL species 0 $x 5 = 0$
1. 0 2. 0 3. 0 4. 0 5. 0 6. 0 7. 0			0.0% 0.0% 0.0% 0.0%		FAC species $\begin{array}{cccccccccccccccccccccccccccccccccccc$
2. 0 3. 0 4. 0 5. 0 6. 0 7. 0			0.0% 0.0% 0.0%		FACU species $\begin{array}{cccccccccccccccccccccccccccccccccccc$
3. 0 4. 0 5. 0 6. 0 7. 0			0.0%		UPL species $0 \times 5 = 0$
4. 0 5. 0 6. 0 7. 0			0.0%		
5	_ [_ [Column Totals: 80 (A) 190 (B)
6			0.0%		
	_ [_ [⊒.			Prevalence Index = B/A =2.375_
8	_ [0.0%		Hydrophytic Vegetation Indicators:
	Γ	┚_	0.0%		Rapid Test for Hydrophytic Vegetation
9		$\square_{_}$	0.0%		✓ Dominance Test is > 50%
0	_ [0.0%		✓ Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size: 15 feet)	_ =	To	tal Cover		Morphological Adaptations ¹ (Provide supporting
1. Lindera benzoin 10) [~	50.0%	FAC	data in Remarks or on a separate sheet)
2. Rosa multiflora	_ [~ ~	50.0%	FACU	☐ 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.
50	_ [0.0%		Definition of Vegetation Strata:
6. 0	_ [0.0%		Four Vegetation Strata:
70	_ [_	0.0%		Tree stratum – Consists of woody plants, excluding vines, 3 in.
		To	tal Cover		(7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Herb Stratum (Flot size. 10 leet)		✓			Sapling/shrub stratum – Consists of woody plants, excluding
1. Carex stricta 30		<u>~</u> ~	50.0%	OBL	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Microstegium vimineum 30		<u>v</u> -	50.0%	FAC	Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.
3		Η-	0.0%		Woody vines – Consists of all woody vines greater than 3.28 ft
т.————————————————————————————————————		Η-	0.0%		in height.
U		Η-			
U		Η-	0.0%		Five Vegetation Strata:
1.			0.0%		Tree - Woody plants, excluding woody vines, approximately 20
-		Η-			ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
9		믁-	0.0%		Sapling stratum – Consists of woody plants, excluding woody
0		닠-	0.0%		vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1		믁-	0.0%		Shrub stratum – Consists of woody plants, excluding woody
2			0.0% tal 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	_	ᆜ-	0.0%		species, except woody vines, less than approximately 3 ft (1 m)
2		닠-	0.0%		in height.
3		닠-	0.0%		Woody vines – Consists of all woody vines, regardless of height.
4	_	ᆜ-	0.0%		The state of the s
5	_ [0.0%		Hydrophytic
6	_ [0.0%		Vegetation V
0	=	То	tal Cover	r	Present? Yes No C

Soil Sampling Point: INC-W-019 (PEM)

Depth	Matrix		Re	dox Features					
(inches)	Color (moist)	<u></u> %	Color (moist)	% Type	1 Loc2	Texture	Remarks		
0-4	10YR 4/4	100				Silt Loam			
4-20	5GY 4/1	80	2.5YR 5/8	20 C	M	Silt Loam			
		n. RM=Redi	uced Matrix, CS=Covere	ed or Coated Sand G	rains ² Loca	tion: PL=Pore Lining. M=M	atrix		
lydric Soil I						Indicators for Proble	ematic Hydric Soils ³ :		
Histosol (A			Dark Surface (2 cm Muck (A10)	(MLRA 147)		
☐ Histic Epip				w Surface (S8) (MLR		Coast Prairie Red	ox (A16)		
Black Histi	Sulfide (A4)			ace (S9) (MLRA 147,	148)	(MLRA 147,148)			
_	Layers (A5)		✓ Loamy Gleyed Depleted Matri:			Piedmont Floodpl	ain Soils (F19)		
	k (A10) (LRR N)		Redox Dark Su			(MLRA 136, 147)	(TE12)		
_	Below Dark Surface (A)	11)	Depleted Dark	` ,		Very Shallow Dark Surface (TF12)			
_ ·	k Surface (A12)	11)	Redox Depress			Other (Explain in Remarks)			
_	ck Mineral (S1) (LRR N			se Masses (F12) (LRF	R N,				
MLRA 147	', 148)	,	MLRA 136)						
Sandy Gle	yed Matrix (S4)			e (F13) (MLRA 136,		3 Indicators of	hudrophutic vocatation and		
Sandy Rec			Piedmont Floor	dplain Soils (F19) (M	LRA 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,			
Stripped M	Matrix (S6)		Red Parent Ma	terial (F21) (MLRA 1	27, 147)	unless di	sturbed or problematic.		
	ayer (if observed):								
estrictive La									
estrictive La Type:	ayer (ii observeu).					Undela Call Decareto	Yes 💿 No 🔾		
						Hydric Soil Present?	res 🙂 No 🔾		
Type: Depth (inch						nyaric soil Present?	res © NO C		
Type: Depth (inch						nydric Soli Present?	TES 🥹 NO 🔾		
Type: Depth (inch						nyaric Soil Present?	res © NO C		
Type: Depth (inch						nyaric Soil Present?	res © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	res © NO C		
Type: Depth (inch						nyaric Soil Present?	res © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	res © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type:						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes © NO C		
Type: Depth (inch						nyaric Soil Present?	Tes S INO C		

Project/Site: Indiantown Gap National Cemetery Expansion Project City/County: Ear	st Hanover, Lebanon Co. Sampling Date: 28-Apr-21
Applicant/Owner: Mabbett & Associates, Inc.	State: PA Sampling Point: INC-W-019 (UPL)
Investigator(s): Bridger Thompson Section, Townshi	
Landform (hillslope, terrace, etc.): Hillside Local relief (concar	ve, convex, none): Slope:8.7 % /
	5.0
Soil Map Unit Name: WeD-Weikert channery silt loam, 15 to 25 percent slopes	Long.: -76.557340° Datum: NAD-83 NWI classification: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? Yes No	(If no, explain in Remarks.)
	Are "Normal Circumstances" present? Yes ● No ○
Are Vegetation \square , Soil \square , or Hydrology \square naturally problematic?	(If needed, explain any answers in Remarks.)
Summary of Findings - Attach site map showing sampling point	t locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes O No •	
Hydric Soil Present? Yes O No • Is the San	npled Area Yes O No •
Wetland Hydrology Present? Yes O No • within a V	
Remarks:	
Upland data point collected to verify the wetland boundary. The data point is located at of the floodplain.	djacent to the wetland in a in a wooded /shrubby lot upslope
Hydrology	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one 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 along Living Root	
Water Marks (B1) Presence of Reduced Iron (C4)	Dry Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6	
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):	
Separ (menes).	Wetland Hydrology Present? Yes ○ No ●
(includes capillary fringe) Yes V No Depth (inches):	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspect	ions), if available:
Remarks:	
No evidence of hydrology.	
I and the second	

		—Species		Sampling Point: INC-W-019 (UPL)
	Absolute			or Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover		Status	
1	0	0.0	0/0	Number of Dominant Species That are OBL, FACW, or FAC:
1				That are obt., FACW, or FAC (A)
2				Total Number of Dominant
3	0	0.0	<u> </u>	Species Across All Strata: 4 (B)
4	0	0.0	%	_
5	=	0.0	%	Percent of dominant Species
		0.0	0/2	That Are OBL, FACW, or FAC: 25.0% (A/B)
6				-
7	0_		<u> </u>	Prevalence Index worksheet:
8	0		<u> </u>	Total % Cover of: Multiply by:
	0	= Total C	over	OBL species
Sapling-Sapling/Shrub Stratum (Plot size:) ——	_		FACW species $0 \times 2 = 0$
1	0	0.0	%	
2		0.0	%	FAC species $\underline{50}$ x 3 = $\underline{150}$
		0.0	0/2	FACU species $40 \times 4 = 160$
3				UPL species $\frac{10}{10}$ x 5 = $\frac{50}{10}$
4				= '
5	0		<u> </u>	Column Totals:(A)(B)
6	_	0.0	%	Prevalence Index = B/A = 3.600
7		0.0	<u> </u>	
		0.0		Hydrophytic Vegetation Indicators:
8				Rapid Test for Hydrophytic Vegetation
9	0	0.0	<u> </u>	─ Dominance Test is > 50%
10	0	0.0	%	Prevalence Index is ≤3.0 ¹
	_	= Total C	over	
Shrub Stratum (Plot size: 15 feet)				Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1. Rosa multiflora	20	66.7	7% FACU	- L
2. Elaeagnus umbellata	10	✓ 33.3	3% UPL	Problematic Hydrophytic Vegetation ¹ (Explain)
3	0	0.0	%	¹ Indicators of hydric soil and wetland hydrology must
4		0.0	0/0	be present, unless disturbed or problematic.
				Definition of Vegetation Strata:
5			<u> </u>	_
6	0	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), regardless
		= Total C	over	of height.
Herb Stratum (Plot size: 10 feet)		_		Sapling/shrub stratum – Consists of woody plants, excluding
1. Microstegium vimineum	50	✓ 71.4	FAC FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
2. Alliaria petiolata	20	✓ 28.6	5% 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.
		0.0		Woody vines – Consists of all woody vines greater than 3.28 ft
4		\neg		in height.
5			<u> </u>	_
6	0	0.0	%	Five Vegetation Strata:
7	0	0.0	%	
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
				diameter at breast height (DBH).
9				Sapling stratum – Consists of woody plants, excluding woody
10	0	0.0	<u> </u>	vines, approximately 20 ft (6 m) or more in height and less than
11	0	0.0	%	3 in. (7.6 cm) DBH.
12	0	0.0	%	Shrub stratum – Consists of woody plants, excluding woody
		= Total C		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,
1	0	0.0	%	including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m)
2	0	0.0	%	in height.
2		0.0		Woody vines – Consists of all woody vines, regardless of
3				height.
4			%	_
5	0	0.0	%	Hydrophytic
6.		0.0	%	Hydrophytic Vegetation
·.		= Total C		Present? Yes No •
		- rotar C	OVEI	
Remarks: (Include photo numbers here or on a separate she	et.)			

Soil Sampling Point: INC-W-019 (UPL)

Profile Descri	iption: (De	escribe to	the depth	needed to documen	t the indica	ator or co	nfirm the a	absence of indicators.)	
Depth		Matrix		Re	dox Featu				
(inches)		(moist)	%	Color (moist)	%	Tvpe 1	Loc2	Texture	Remarks
0-4	10YR	4/4	_ 100					Silt Loam	
4-20	10YR	5/4	100					Silty Clay	
			-						
¹ Type: C=Cond	centration. [D=Depletio	n. RM=Red	uced Matrix, CS=Cover	ed or Coate	d Sand Gra	ains ² Loca	tion: PL=Pore Lining. M=M	atrix
Hydric Soil I	ndicators:							Indicators for Proble	ematic Hydric Soils ³ :
Histosol (A	A1)			Dark Surface (,			2 cm Muck (A10)	
Histic Epip	pedon (A2)			Polyvalue Belo	•	, ,		Coast Prairie Red	,
Black Histi	` '			Thin Dark Surf	ace (S9) (M	LRA 147, 1	L48)	(MLRA 147,148)	ox (A10)
	Sulfide (A4			Loamy Gleyed				Piedmont Floodpl	lain Soils (F19)
	Layers (A5)			Depleted Matri				(MLRA 136, 147)	, ,
2 cm Muck	k (A10) (LRI	R N)			Redox Dark Surface (F6)				k Surface (TF12)
	Below Dark	•	11)	Depleted Dark		')		Other (Explain in	Remarks)
	k Surface (A	•		Redox Depress	. ,	-10) (100			
Sandy Mud MLRA 147	ck Mineral (7, 148)	S1) (LRR N	١,	Iron-Manganes MLRA 136)					
Sandy Gle	yed Matrix	(S4)		Umbric Surfac	e (F13) (ML	RA 136, 12	22)	3	bandanahadi ana sabadi an anad
Sandy Rec	dox (S5)			Piedmont Floo	dplain Soils	(F19) (MLI	RA 148)	Indicators of wetland hyd	hydrophytic vegetation and drology must be present,
Stripped M	Matrix (S6)			Red Parent Ma	iterial (F21)	(MLRA 12	7, 147)		sturbed or problematic.
Restrictive La	ayer (if ob	served):							
Type:								Undein Cail Bussents	Yes ○ No ●
Depth (inch	hes):							Hydric Soil Present?	Yes ○ No •
Remarks:									

Project/Site: Indiantown Gap	National Cemetery Expansion Project	City/County: East Hanover	, Lebanon Co. Sam	pling Date: 28-Apr-21
Applicant/Owner: Mabbett & A	Associates, Inc.	State:	PA Sampling F	oint: INC-W-020 (PEM)
Investigator(s): Bridger Thom	ıpson	Section, Township, Range	: S T	R
Landform (hillslope, terrace, et	tc.): Floodplain	Local relief (concave, conve	x, none): convex	Slope: 8.7 % / 5.0 °
Subregion (LRR or MLRA):	MLRA 147 in LRR S	Lat.: 40.421677°	Long.: -76.557662°	Datum: NAD-83
_	eikert channery silt loam, 15 to 2		NWI classificatio	
Are climatic/hydrologic conditi	ions on the site typical for this tim	ne of year? Yes $lacktriangle$ No $lacktriangle$ (If	no, explain in Remarks.)	
Are Vegetation \Box , Soil	, or Hydrology sign	ificantly disturbed? Are "Nor	mal Circumstances" preser	_{nt?} Yes • No O
Are Vegetation $\ \ \ \ $, Soil	, or Hydrology natu	rally problematic? (If neede	ed, explain any answers in	Remarks.)
Summary of Findings	- Attach site map show	ing sampling point locati	ons, transects, imp	oortant features, etc.
Hydrophytic Vegetation Prese				
Hydric Soil Present?	Yes 💿 No 🔾	Is the Sampled Are	a Yes ● No ○	
Wetland Hydrology Present?	Yes 💿 No 🔾	within a Wetland?	100 0 110 0	
Remarks:		<u> </u>		
	I to document the existing condition	ons. The data point is located in a or the channel.	a natural gully that contair	ns a small perennial
Hydrology				
Wetland Hydrology Indicator	s:		Secondary Indicators (m	inimum of two required)
Primary Indicators (minimum	n of one required; check all that a	pply)	Surface Soil Cracks (B6)
Surface Water (A1)	True Aquat	ic Plants (B14)	Sparsely Vegetated (Concave Surface (B8)
High Water Table (A2)	Hydrogen S	Sulfide Odor (C1)	Drainage Patterns (B	10)
✓ Saturation (A3)	Oxidized R	hizospheres along Living Roots (C3)	Moss Trim Lines (B1	5)
☐ Water Marks (B1)	Presence o	f Reduced Iron (C4)	Dry Season Water Ta	able (C2)
Sediment Deposits (B2)	Recent Iron	n 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)		lain 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 Re	
Aquatic Fauna (B13)			FAC-neutral Test (D5	
Field Observations:				,
Surface Water Present?	/es O No Oepth (in	ches):		
Water Table Present?	′es ○ No ● Depth (in			
Saturation Present?	′es ● No ○ Depth (in		lydrology Present? Ye	s • No O
(includes capillary irringe)		I photos, previous inspections), if a	vailable:	
(11	3.13., 1 1 3 3 1,11	,, p		
Remarks:				

	Alexadasta	-Species?		
Tree Stratum (Plot size:)	Absolute % Cover	Rel.Strat. Cover	Indicator Status	
1	0	0.0%		Number of Dominant Species That are OBL, FACW, or FAC:1(A)
2	0	0.0%		Tabal Number of Demiserat
3		0.0%		Total Number of Dominant Species Across All Strata: 1 (B)
4		0.0%		
5		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 Cov		OBL species 20 x 1 = 20
Sapling-Sapling/Shrub Stratum (Plot size:		_	-	FACW species $0 \times 2 = 0$
1	0	0.0%		FAC species $50 \times 3 = 150$
2	0	0.0%		
3	0	0.0%		FACU species $\frac{10}{2}$ x 4 = $\frac{40}{2}$
4	0	0.0%		UPL species $0 \times 5 = 0$
5		0.0%		Column Totals: <u>80</u> (A) <u>210</u> (B)
6	_	0.0%		Prevalence Index = B/A = 2.625
7	0	0.0%		Hydrophytic Vegetation Indicators:
8		0.0%		Rapid Test for Hydrophytic Vegetation
9		0.0%		
0		0.0%		✓ Dominance Test is > 50%
	_	= Total Cov		Prevalence Index is ≤3.0 ¹
Shrub Stratum (Plot size:)				Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
1		0.0%		Problematic Hydrophytic Vegetation ¹ (Explain)
2				Problematic nytrophytic vegetation (Explain)
3	0			¹ 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	0.0%		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), regardless
Herb Stratum (Plot size: 10 feet)	0 :	= Total Cov	er	of height.
1. Microstegium vimineum	50	62.5%	FAC	Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
0.0	10	12.5%		Herb stratum – Consists of all herbaceous (non-woody) plants,
Sympiocarpus roetidus Alliaria petiolata	10	12.5%		regardless of size, and all other plants less than 3.28 ft tall.
4. Carex stricta	10	12.5%		Woody vines – Consists of all woody vines greater than 3.28 ft
	0	0.0%		in height.
5		0.0%		
6				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	0			Sapling stratum – Consists of woody plants, excluding woody
0	0			vines, approximately 20 ft (6 m) or more in height and less than
1	0			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:)	80=	= Total Cov	er	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%		Woody vines – Consists of all woody vines, regardless of
3		0.0%		height.
4				
5				Hydrophytic
6		0.0%		Vegetation Present? Yes No
	0	= Total Co	or	Present? Yes VO V

Soil Sampling Point: INC-W-020 (PEM)

Depth	Matrix		R	edox Featu						
(inches)	Color (moist)	%	Color (moist)	%	Tvpe 1	Loc ²	Texture	Remarks		
0-4	10YR 4/4	100					Silt Loam			
4-20	2.5YR 5/1	80	2.5YR 5/8	20	С	М	Silty Clay			
							-			
							-			
	-			_			-			
		-		-	-					
Type: C=Con	centration. D=Depletion	on. RM=Red	uced Matrix, CS=Cove	red or Coate	d Sand Gra	ins ²Loca	tion: PL=Pore Lining. M=Mat	rix		
lydric Soil 1										
Histosol (Dark Surface	(\$7)			Indicators for Problem	-		
_	pedon (A2)		Polyvalue Belo		S8) (MI RA	147 148)	2 cm Muck (A10) (N	1LRA 147)		
Black Hist			Thin Dark Sur				Coast Prairie Redox	(A16)		
_	Sulfide (A4)		Loamy Gleyed			10)	(MLRA 147,148)			
_	Layers (A5)		✓ Depleted Matr				Piedmont Floodplair (MLRA 136, 147)	1 Soils (F19)		
_	k (A10) (LRR N)		Redox Dark S				_	Surface (TE12)		
_	Below Dark Surface (A	111	Depleted Dark	` ,	7)		✓ Very Shallow Dark Surface (TF12)✓ Other (Explain in Remarks)			
_ '	k Surface (A12)	111)	Redox Depres		,		Uther (Explain in Re	emarks)		
_	ick Mineral (S1) (LRR	N	☐ Iron-Mangane	` '	F12) (LRR N	١,				
MLRA 147	7, 148)	ΙΝ,	MLRA 136)	`	, (,				
Sandy Gle	eyed Matrix (S4)		Umbric Surfac	ce (F13) (ML	.RA 136, 12	2)	2			
Sandy Re	dox (S5)		Piedmont Floo	odplain Soils	(F19) (MLR	A 148)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
Stripped I	Matrix (S6)		Red Parent M	aterial (F21)	(MLRA 127	, 147)				
	(Cf - b 1)									
	ayer (if observed):									
Type:	hos):						Hydric Soil Present?	Yes No		
Depth (inc	nes):									
Remarks:										

Project/Site: Indiantown Gap Nation	nal Cemetery Expansion Project	City/County: East Hanover, Le	ebanon Co. Sampling Date: 28-Apr-21
Applicant/Owner: Mabbett & Associa	ates, Inc.	State: PA	Sampling Point: INC-W-020 (UPL)
Investigator(s): Bridger Thompson		Section, Township, Range: S	
Landform (hillslope, terrace, etc.):	Floodplain	Local relief (concave, convex, r	none): concave Slope: 8.7 % / 5.0
Subregion (LRR or MLRA): MLRA	147 in LRR S Lat.:	40.421727° Lor	ng.: -76.557720° Datum: NAD-83
Soil Map Unit Name: WeD-Weikert			NWI classification: N/A
Are climatic/hydrologic conditions o			, explain in Remarks.)
Are Vegetation, Soil	, or Hydrology significant	ly disturbed? Are "Normal	I Circumstances" present? Yes NO
Are Vegetation U , Soil U	, or Hydrology 🔲 naturally p	problematic? (If needed,	explain any answers in Remarks.)
Summary of Findings - At	ttach site map showing s	sampling point location	ns, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes ○ No •		
Hydric Soil Present?	Yes O No 💿	Is the Sampled Area	Yes ○ No ●
Wetland Hydrology Present?	Yes O No 💿	within a Wetland?	res UNO U
Remarks:			
Hydrology			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two required)
Primary Indicators (minimum of o			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)		eres along Living Roots (C3)	Moss Trim Lines (B16)
Sediment Deposits (B2)	Presence of Reduc	• •	Dry Season Water Table (C2)
Drift deposits (B3)		ction 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)	Other (Explain in F	Remarks)	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	No Depth (inches):		
Saturation Present? (includes capillany frings) Yes	No Depth (inches):	Wetland Hyd	rology Present? Yes O No 💿
(includes capillary fringe) Describe Recorded Data (stream games)	,	ns previous inspections) if avai	lable:
Describe Recorded Data (stream gr	dage, monitoring wen, denai priote	os, previous inspections), ii avai	iddic.
Remarks:			
remarks:			

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

	Species?			Sampling Point: INC-W-020 (OPL)		
	Absolute			Dominance Test worksheet:		
Tree Stratum (Plot size:)	% Cover		Status			
1	0	0.09	6	Number of Dominant Species That are OBL, FACW, or FAC:		
1				That are obt., facw, of fac.		
2				Total Number of Dominant		
3	0		<u>/</u>	Species Across All Strata:4 (B)		
4	0	0.09	/0			
5		0.09	6	Percent of dominant Species		
		0.09	<u></u>	That Are OBL, FACW, or FAC: 50.0% (A/B)		
6						
7	0_		<u>/o</u>	Prevalence Index worksheet:		
8	0	0.09	<u>/o</u>	Total % Cover of: Multiply by:		
4-4	0	= Total Co	ver	OBL species		
Sapling-Sapling/Shrub Stratum (Plot size:) ——	_		FACW species $0 \times 2 = 0$		
1	0	0.09	<u>/</u>			
2		0.09	/ o	FAC species $\underline{70}$ x 3 = $\underline{210}$		
		0.09	<u> </u>	FACU species $30 \times 4 = 120$		
3				UPL species $0 \times 5 = 0$		
4				·		
5	0	0.09	<u>/o</u>	Column Totals: 100 (A) 330 (B)		
6	_	0.09	%	Prevalence Index = $B/A = 3.300$		
7		0.09	/o			
		0.09		Hydrophytic Vegetation Indicators:		
8				Rapid Test for Hydrophytic Vegetation		
9	0	0.09	<u>/6</u>	Dominance Test is > 50%		
10	0	0.09	/0	Prevalence Index is ≤3.0 ¹		
	_	= Total Co	ver			
Shrub Stratum (Plot size: 15 feet)				Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)		
1. Lindera benzoin	10	50.0	% FAC			
2. Rosa multiflora	10	50.0	% FACU	☐ Problematic Hydrophytic Vegetation ¹ (Explain)		
3	0	0.09	%	¹ Indicators of hydric soil and wetland hydrology must		
4		0.09	/6	be present, unless disturbed or problematic.		
				Definition of Vegetation Strata:		
5			<u></u>	<u> </u>		
6	0	0.09	<u>/o</u>	Four Vegetation Strata:		
7		0.09	%	Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless		
		= Total Co	ver	of height.		
Herb Stratum (Plot size: 10 feet)				Sapling/shrub stratum – Consists of woody plants, excluding		
1. Microstegium vimineum	60	75.0	% FAC	vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
2. Alliaria petiolata	20	✓ 25.0°	% FACU	Herb stratum – Consists of all herbaceous (non-woody) plants,		
3	0	0.09	/o	regardless of size, and all other plants less than 3.28 ft tall.		
		0.09		Woody vines – Consists of all woody vines greater than 3.28 ft		
4		\neg		in height.		
5			<u>/o</u>			
6	0	0.09	<u>/</u>	Five Vegetation Strata:		
7	0	0.09	6			
8.	_	0.09	/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		
				diameter at breast height (DBH).		
9				Sapling stratum – Consists of woody plants, excluding woody		
10	0	0.09	<u>/</u>	vines, approximately 20 ft (6 m) or more in height and less than		
11	0	0.09	/o	3 in. (7.6 cm) DBH.		
12	0	0.09	6	Shrub stratum – Consists of woody plants, excluding woody		
		= Total Co		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,		
1	0	0.09	<u>/</u>	including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m)		
2	0	0.09	6	in height.		
2		0.09		Woody vines – Consists of all woody vines, regardless of		
3				height.		
4			/0	<u> </u>		
5	0	0.09	<u>/</u>	Hydronhytic		
6.			/ ₆	Hydrophytic Vegetation Present? Yes No No		
·.						
		- iotai C	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Remarks: (Include photo numbers here or on a separate she	et.)					

Soil Sampling Point: INC-W-020 (UPL)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth	Matrix			lox Featu	ires 1						
(inches)	Color (moist)		Color (moist)	%_	Type 1	Loc2	<u>Texture</u>	Remarks			
0-4	10YR 4/3	100					Silt Loam				
4-20	10YR 5/3	100					Silty Clay				
							-				
								-			
¹ Type: C=Con	centration. D=Depletion	n. RM=Redi	uced Matrix, CS=Covere	d or Coate	ed Sand Gra	ins ² Loca	tion: PL=Pore Lining. M=M	atrix			
Hydric Soil I	indicators:						Indicators for Proble	ematic Hydric Soils ³ :			
Histosol (A1)		Dark Surface (Dark Surface (S7)				2 cm Muck (A10) (MLRA 147)			
Histic Epip	pedon (A2)		Polyvalue Below	v Surface ((S8) (MLRA	147,148)					
☐ Black Hist	ic (A3)		Thin Dark Surfa	ice (S9) (M	1LRA 147, 1	48)	Coast Prairie Red (MLRA 147,148)	0X (A16)			
Hydrogen	Sulfide (A4)		Loamy Gleyed	Matrix (F2))		Piedmont Floodplain Soils (F19)				
Stratified	Layers (A5)		Depleted Matrix	(F3)			(MLRA 136, 147)				
2 cm Muc	k (A10) (LRR N)		Redox Dark Su	face (F6)			Very Shallow Dar	k Surface (TF12)			
☐ Depleted	Below Dark Surface (A	.11)	Depleted Dark	Surface (F	7)		Other (Explain in				
Thick Dar	k Surface (A12)	,	Redox Depress	ons (F8)			Outer (Explain in	remandy			
	ick Mineral (S1) (LRR N	١,	Iron-Manganes MLRA 136)	e Masses ((F12) (LRR	Ν,					
_			Umbric Surface	(F13) (MI	RA 136, 12	2)					
Sandy Gleyed Matrix (S4)		Piedmont Floor				³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.					
Sandy Redox (S5) Stripped Matrix (S6)			Red Parent Ma								
Запрреа п	-lati		Red Falent Ma	.ciiai (i 21) (MLKA 12.	,, 17/)	uriless ur	зыньей от рговлетанс.			
Restrictive L	ayer (if observed):										
Туре:							Hydric Soil Present?	Yes ○ No •			
Depth (inc	hes):						nyulic 3011 Presents	res Uno U			
Remarks:											

Appendix C Photo Log

Date:

1

10/07/20

Feature ID:

Existing Conditions

Direction:

Southwest

Description:

View of the existing facing southwest from the edge of the Study Area into the maintained cemetery grounds.



Photograph:

Date:

2

10/08/20

Feature ID:

Existing Conditions

Direction:

North

Description:

View of the typical wooded/shrubby conditions found throughout the Study Area.



Date:

3

10/08/20

Feature ID:

Existing Conditions

Direction:

South

Description:

View of the open forested conditions found throughout the Study Area.



Photograph:

Date:

4

10/08/20

Feature ID:

Existing Conditions

Direction:

Northeast

Description:

View of the existing transmission line right-of-way that bisects the Study Area running east to west.



Date:

5

10/07/20

Feature ID:

Wetland INC-W-001 (PEM)

Direction:

Northwest

Description:

View of wetland data point INC-W-001 (PEM).



Photograph:

Date:

6

10/07/20

Feature ID:

Upland INC-W-001 (UPL)

Direction:

East

Description:

View of upland data point INC-W-001 (UPL).



Date:

7

10/07/20

Feature ID:

Wetland INC-W-002 (PEM)

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-002 (PEM).



Photograph:

Date:

8

10/07/20

Feature ID:

Upland INC-W-002 (UPL)

Direction:

East

Description:

View of upland data point INC-W-002 (UPL).



9

10/07/20

Date:

Feature ID:

Wetland INC-W-003 (PEM)

Direction:

South

Description:

View of wetland data point INC-W-003 (PEM) facing upstream along the intermittent channel.



Photograph:

10

10/07/20

Date:

Feature ID:

Upland INC-W-003 (UPL)

Direction:

East

Description:

View of upland data point INC-W-003 (UPL).



Date:

11

10/07/20

Feature ID:

Wetland INC-W-004 (PEM)

Direction:

East

Description:

View of wetland data point INC-W-004 (PEM).



Photograph:

Date:

12

10/07/20

Feature ID:

Upland INC-W-004 (UPL)

Direction:

West

Description:

View of upland data point INC-W-004 (UPL) facing west from the wetland core.



Date:

13

10/07/20

Feature ID:

Wetland INC-W-005 (PEM)

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-005 facing north within the transmission line right-of-way.



Photograph:

Date:

14

10/07/20

Feature ID:

Upland INC-W-005 (UPL)

Direction:

East

Description:

View of upland data point INC-W-005 (UPL) facing east along the transmission line right-of-way.



Date:

15

10/07/20

Feature ID:

Wetland INC-W-006 (PEM)

Direction:

Southwest

Description:

View of the vegetative conditions in wetland INC-W-006.



Photograph:

Date:

16

10/07/20

Feature ID:

Upland INC-W-006 (UPL)

Direction:

West

Description:

View of upland data point INC-W-006 (UPL).



Date:

17

10/08/20

Feature ID:

Wetland INC-W-007 (PEM)

Direction:

North

Description:

View of the vegetative conditions in wetland INC-W-007.



Photograph:

Date:

18

10/07/20

Feature ID:

Upland INC-W-007 (UPL)

Direction:

West

Description:

View of upland data point INC-W-007 (UPL).



Date:

19

10/08/20

Feature ID:

Wetland INC-W-008 (PEM)

Direction:

Northwest

Description:

View of the vegetative conditions in wetland INC-W-008.



Photograph:

Date:

20

10/08/20

Feature ID:

Upland INC-W-008 (UPL)

Direction:

West

Description:

View of upland data point INC-W-008 (UPL) facing west from the wetland edge.



Date:

21

10/08/20

Feature ID:

Wetland INC-W-009 (PEM)

Direction:

North

Description:

View of wetland INC-W-009 facing north toward the maintained cemetery grounds.



Photograph:

Date:

22

10/08/20

Feature ID:

Upland INC-W-009 (IPL)

Direction:

West

Description:

View of upland data point INC-W-009 (UPL) facing upslope from the center of the constructed swale that contains the wetland.



Date:

23

10/08/20

Feature ID:

Wetland INC-W-010 (PEM)

Direction:

Northwest

Description:

View of the vegetative conditions at wetland data point INC-W-010 (PEM).



Photograph:

Date:

24

10/08/20

Feature ID:

Upland INC-W-010 (UPL)

Direction:

North

Description:

View of upland data point INC-W-010 (UPL).



Date:

25

10/08/20

Feature ID:

Wetland INC-W-011 (PEM)

Direction:

North

Description:

View of the vernal pool/PEM conditions of wetland INC-W-011 (PEM).



Photograph:

Date:

26

10/08/20

Feature ID:

Upland INC-W-011 (UPL)

Direction:

West

Description:

View of the conditions at upland data point INC-W-011 (UPL).



Date:

27

10/08/20

Feature ID:

Wetland INC-W-012 (PEM)

Direction:

East

Description:

View of the vegetative conditions at wetland data point INC-W-012 (PEM).



Photograph:

Date:

28

10/08/20

Feature ID:

Upland INC-W-012 (UPL)

Direction:

Northeast

Description:

View of upland data point INC-W-012 (UPL).



Date:

29

10/08/20

Feature ID:

Wetland INC-W-013 (PEM)

Direction:

North

Description:

View of wetland data point INC-W-013 (PEM).



Photograph:

Date:

30

10/08/20

Feature ID:

Upland INC-W-013 (UPL)

Direction:

East

Description:

View of upland data point INC-W-013 (UPL).



Date:

31

10/07/20

Feature ID:

Wetland INC-W-015 (PEM)

Direction:

Northwest

Description:

View of the typical vegetative conditions found in wetland INC-W-015.



Photograph:

Date:

32

10/07/20

Feature ID:

Upland INC-W-015 (UPL)

Direction:

Southwest

Description:

The vegetative conditions at the upland data point INC-W-015 (UPL)



Photograph: Date: 33 04/28/21

Wetland INC-W-019 (PEM)

Direction:

Feature ID:

Northeast

Description:

View of the typical vegetative conditions found in wetland INC-W-019.



Photograph: Date:

34

04/28/21

Feature ID:

Upland INC-W-019 (UPL)

Direction:

Southeast

Description:

View of vegetative conditions at the upland data point INC-W-019-(UPL).



Photograph: Date: 35

04/28/21

Feature ID:

Wetland INC-W-020 (PEM)

Direction:

Southeast

Description:

View of the typical vegetative conditions found in wetland INC-W-020.



Photograph: Date:

> 36 04/28/21

Feature ID:

Upland INC-W-020 (UPL)

Direction:

Northwest

Description:

View of the vegetative condition at the upland data point INC-W-020 (UPL).



Date:

37

10/07/20

Feature ID:

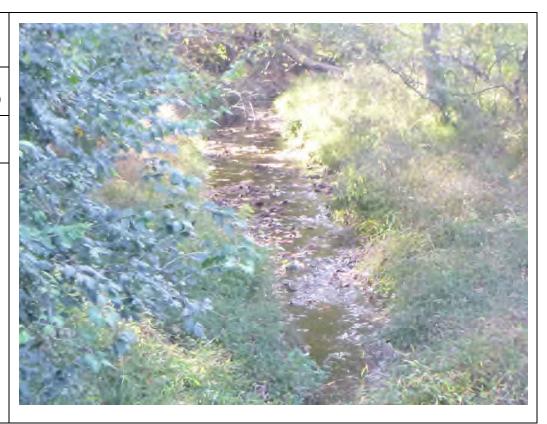
Watercourse INC-S-001 (PER)

Direction:

Northwest

Description:

View facing upstream on watercourse INC-S-001.



Photograph:

Date:

38

10/07/20

Feature ID:

Watercourse INC-S-002 (INT)

Direction:

South

Description:

View facing upstream on watercourse INC-S-002.



Date:

39

10/07/20

Feature ID:

Watercourse INC-S-003 (EPH)

Direction:

North

Description:

View facing downstream on watercourse INC-S-003.



Photograph:

Date:

40

11/02/20

Feature ID:

Watercourse INC-S-004 (EPH)

Direction:

North

Description:

View of channel INC-S-004.



Date:

41

10/08/20

Feature ID:

Watercourse INC-S-005 (INT)

Direction:

East

Description:

View facing downstream on watercourse INC-S-005.



Photograph:

Date:

42

10/08/20

Feature ID:

Watercourse INC-S-006 (INT)

Direction:

North

Description:

View of facing upstream on watercourse INC-S-006 where it connects to wetland INC-W-002.



Date:

43

10/08/20

Feature ID:

Watercourse INC-S-007 (EPH)

Direction:

North

Description:

View facing upstream on watercourse INC-S-007from the confluence with INC-S-005.



Photograph:

Date:

44

10/08/20

Feature ID:

Watercourse INC-S-008 (INT)

Direction:

South

Description:

View of the watercourse INC-S-008 facing upstream from the confluence with INC-S-005.



Photograph: Date:

45

10/07/20

Feature ID:

Watercourse INC-S-009 (PER)

Direction:

South

Description:

View facing upstream on watercourse INC-S-009.



Photograph: Date:

46

10/07/20

Feature ID:

Watercourse INC-S-010 (EPH)

Direction:

East

Description:

View of watercourse INC-S-010 facing downstream from the its origin.



Date:

47

10/07/20

Feature ID:

Watercourse INC-S-011 (EPH)

Direction:

South

Description:

View facing upstream on watercourse INC-S-0.



Photograph:

Date:

48

10/08/20

Feature ID:

Watercourse INC-S-012 (PER)

Direction:

North

Description:

View of watercourse INC-S-012 facing upstream.



Date:

49

10/08/20

Feature ID:

Watercourse INC-S-013 (INT)

Direction:

North

Description:

View facing upstream on watercourse INC-S-013 where it drains from wetland INC-W-007.



Photograph:

Date:

50

10/08/20

Feature ID:

Watercourse INC-S-014 (EPH)

Direction:

West

Description:

View facing upstream on watercourse INC-S-014.



Date:

51

10/08/20

Feature ID:

Watercourse INC-S-015 (INT)

Direction:

South

Description:

View facing upstream on watercourse INC-S-015 where it drains from wetland INC-W-009.



Photograph:

Date:

52

10/08/20

Feature ID:

Watercourse INC-S-016 (EPH)

Direction:

South

Description:

View facing downstream on INC-S-016.



Date:

53

10/08/20

Feature ID:

Watercourse INC-S-017 (INT)

Direction:

Southwest

Description:

View facing upstream on watercourse INC-S-017.



Photograph:

Date:

54

10/08/20

Feature ID:

Watercourse INC-S-018 (EPH)

Direction:

South

Description:

View facing downstream on INC-S-018.



Date:

55

10/08/20

Feature ID:

Watercourse INC-S-019 (PER)

Direction:

North

Description:

View of the typical channel conditions on INC-S-019.

