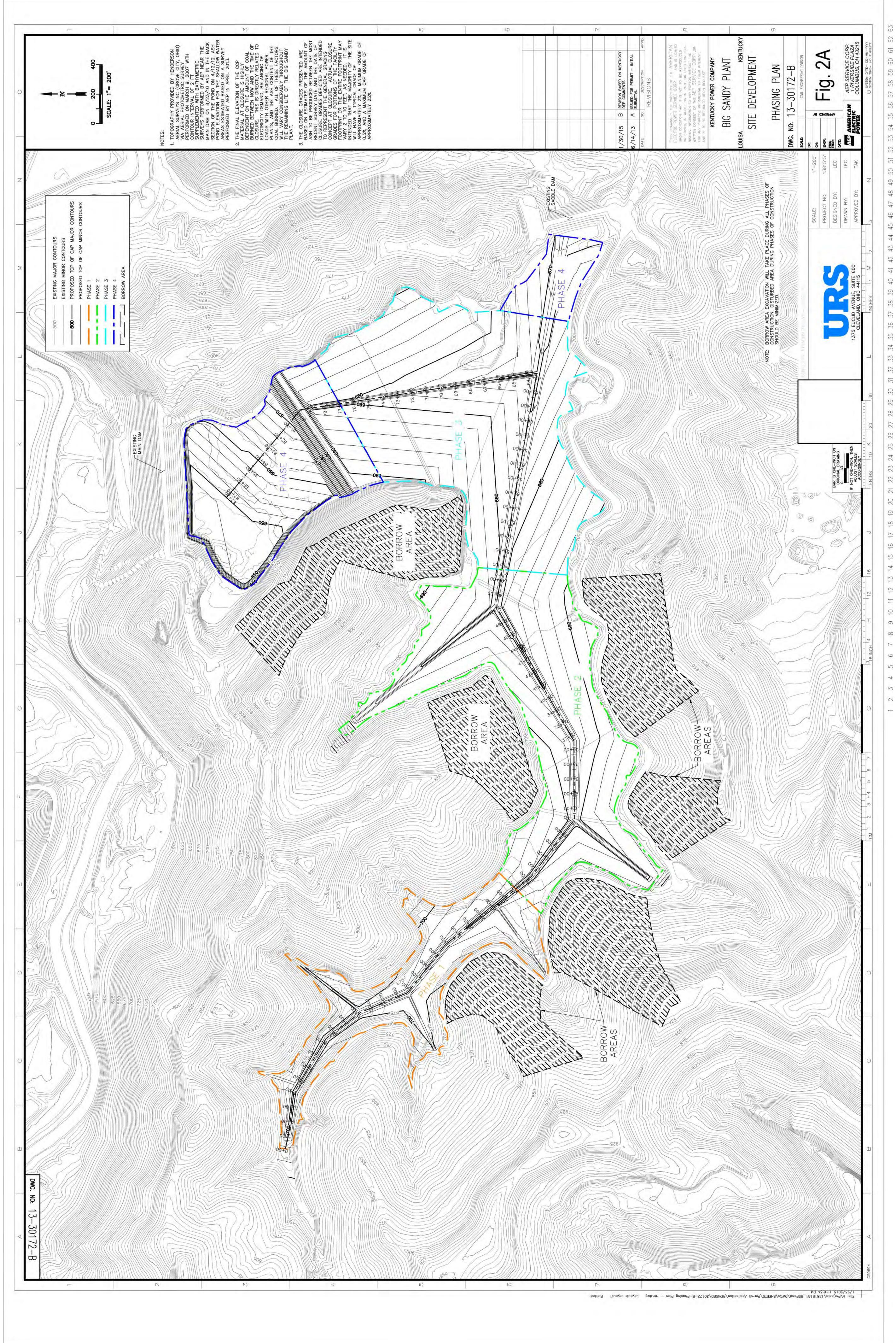
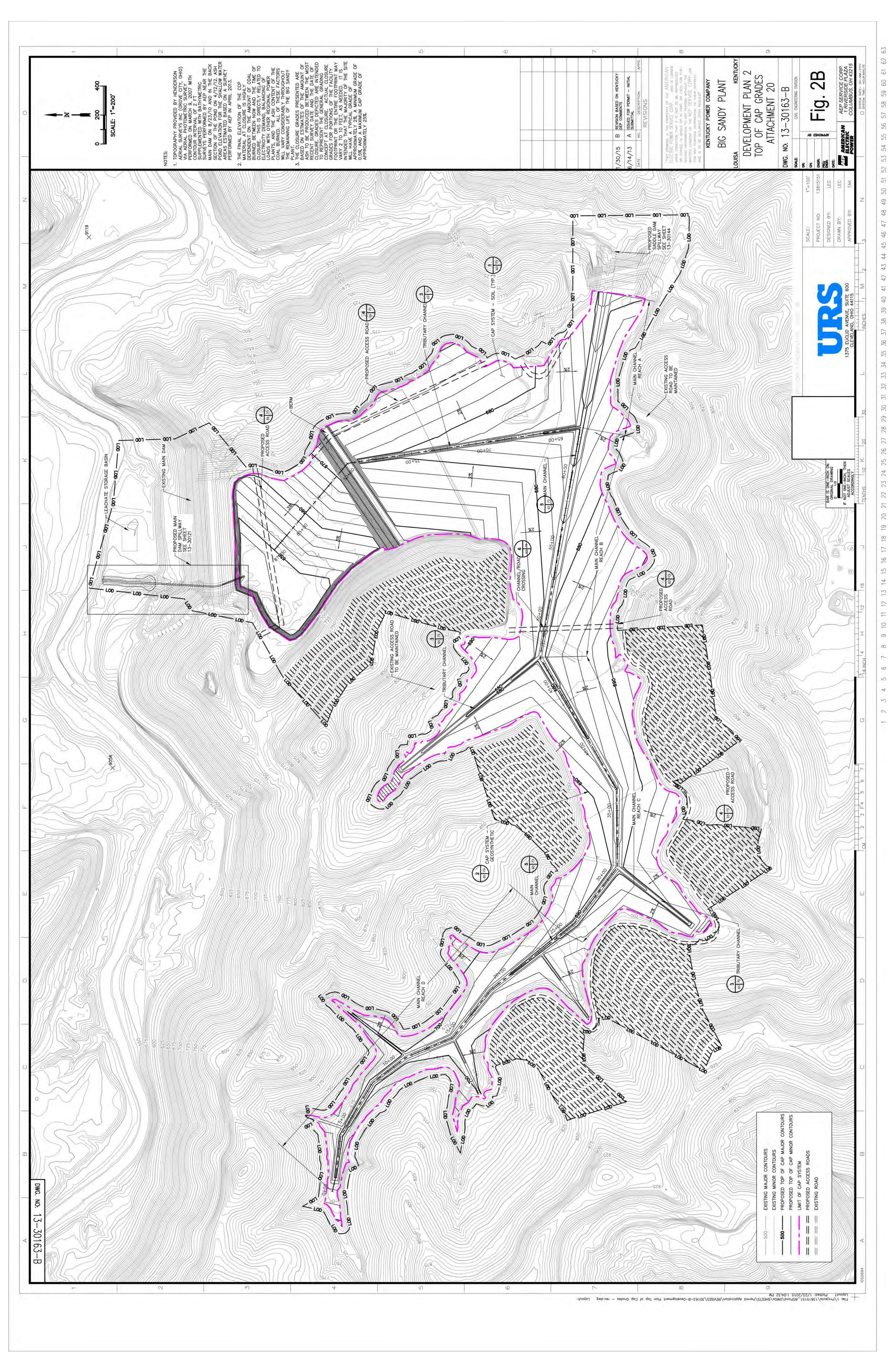


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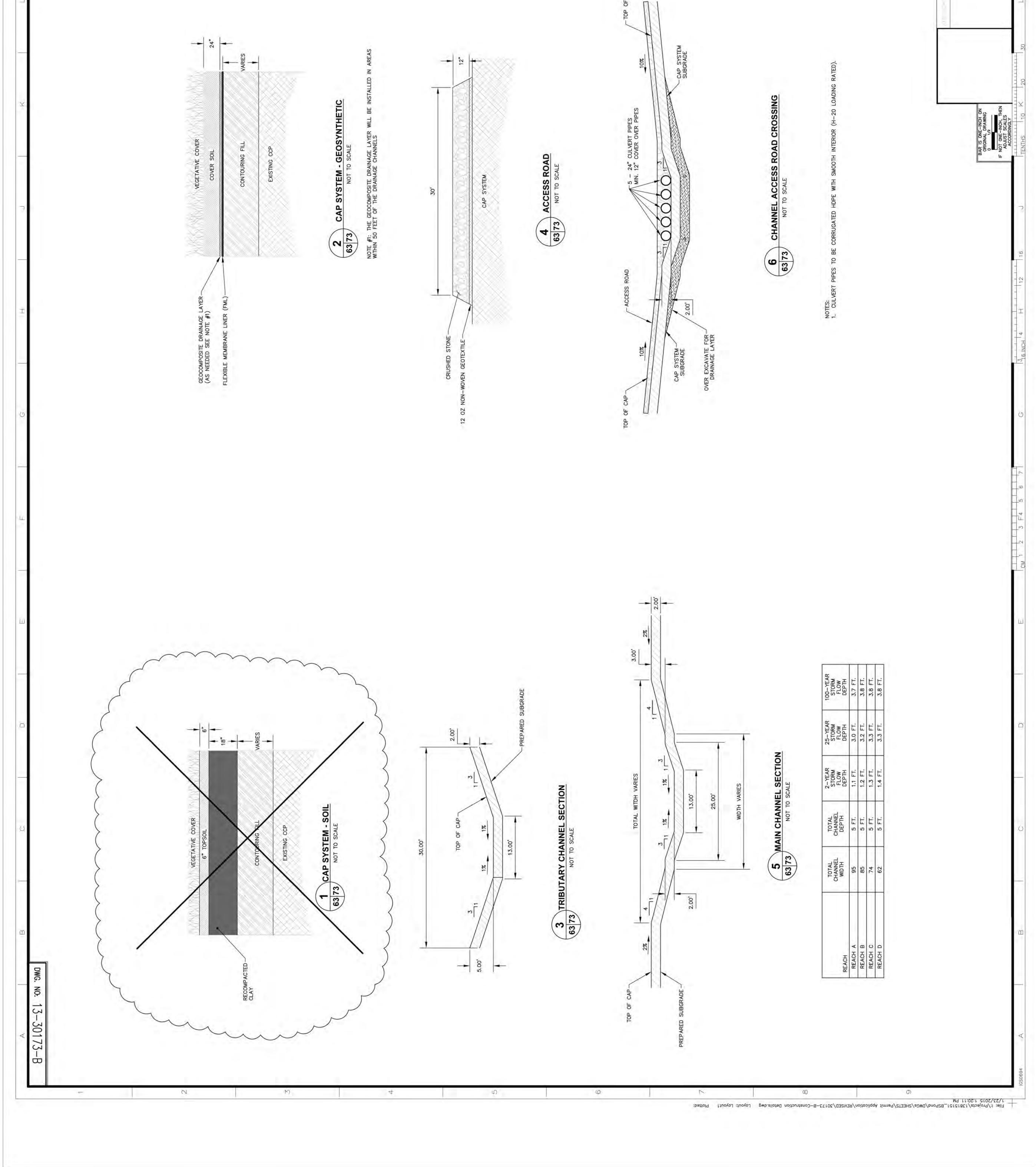
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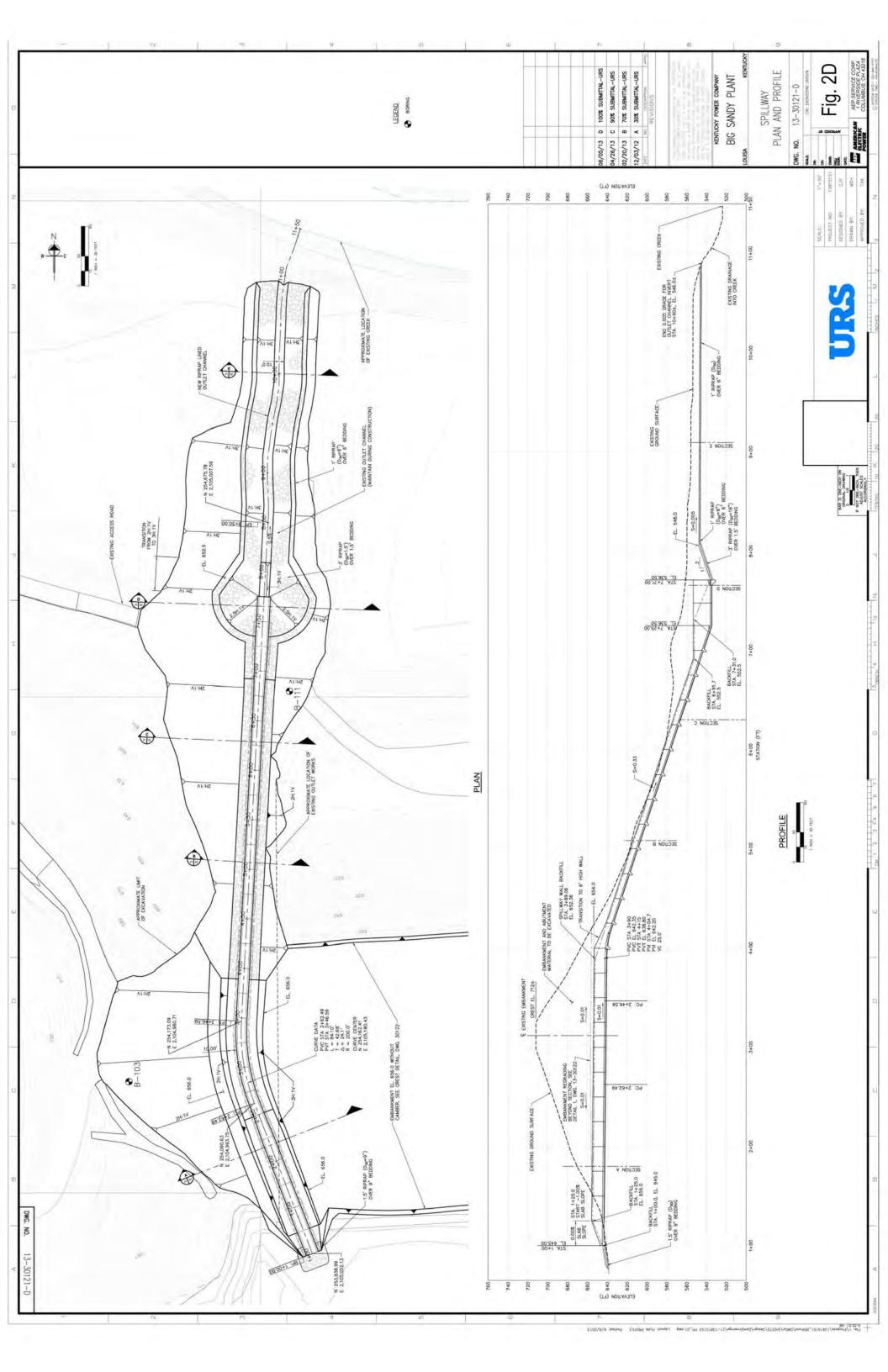
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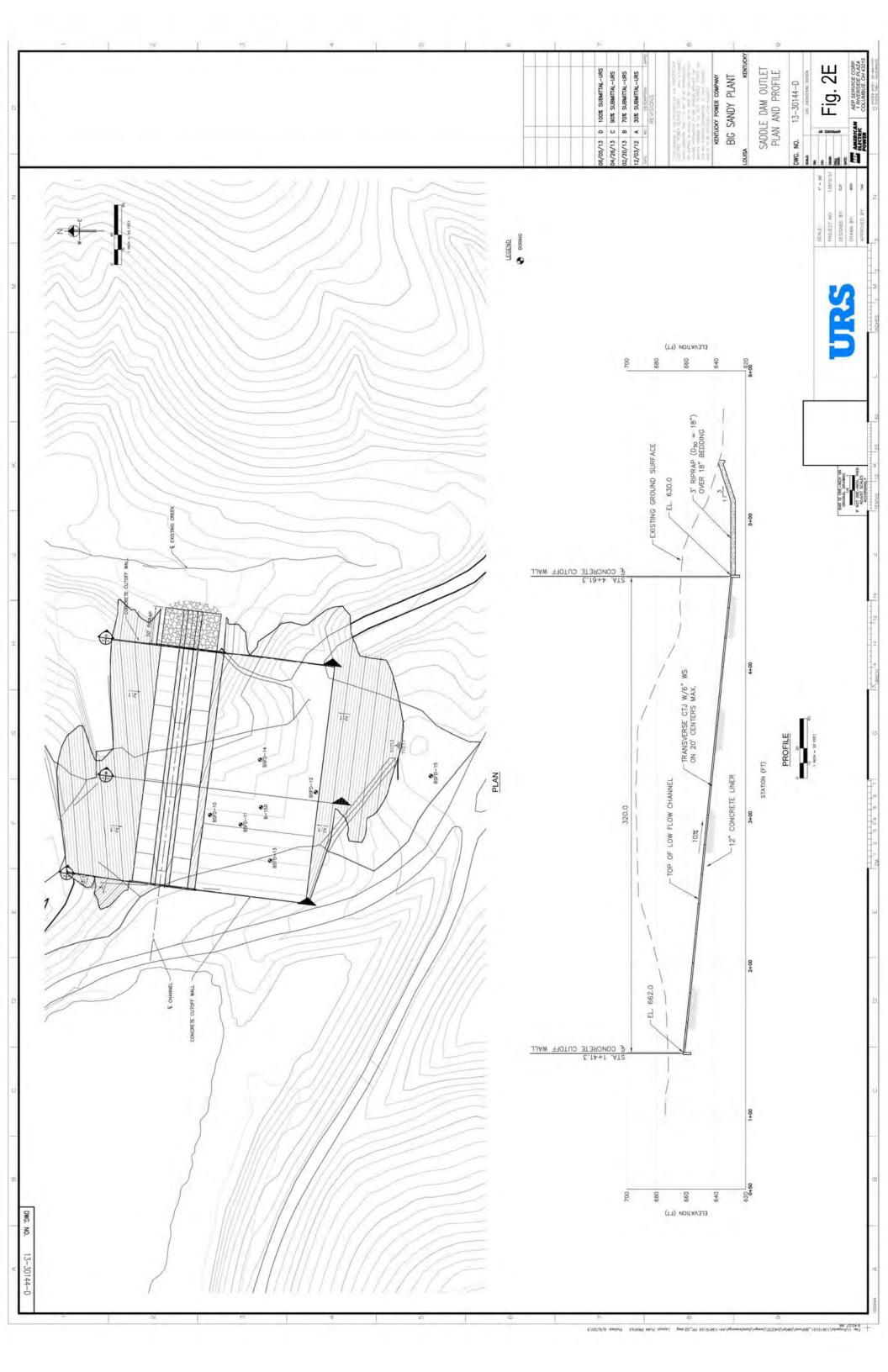
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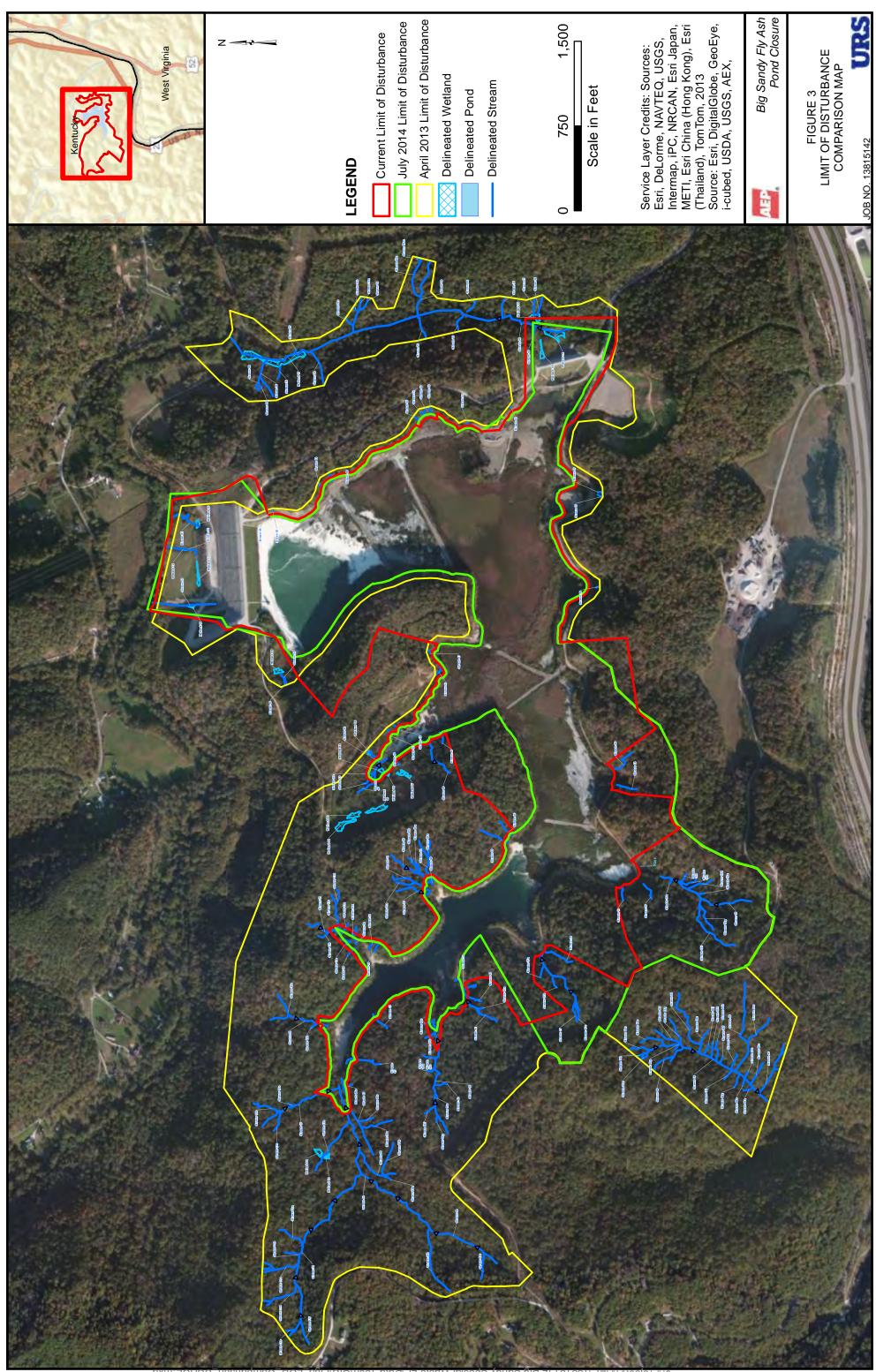
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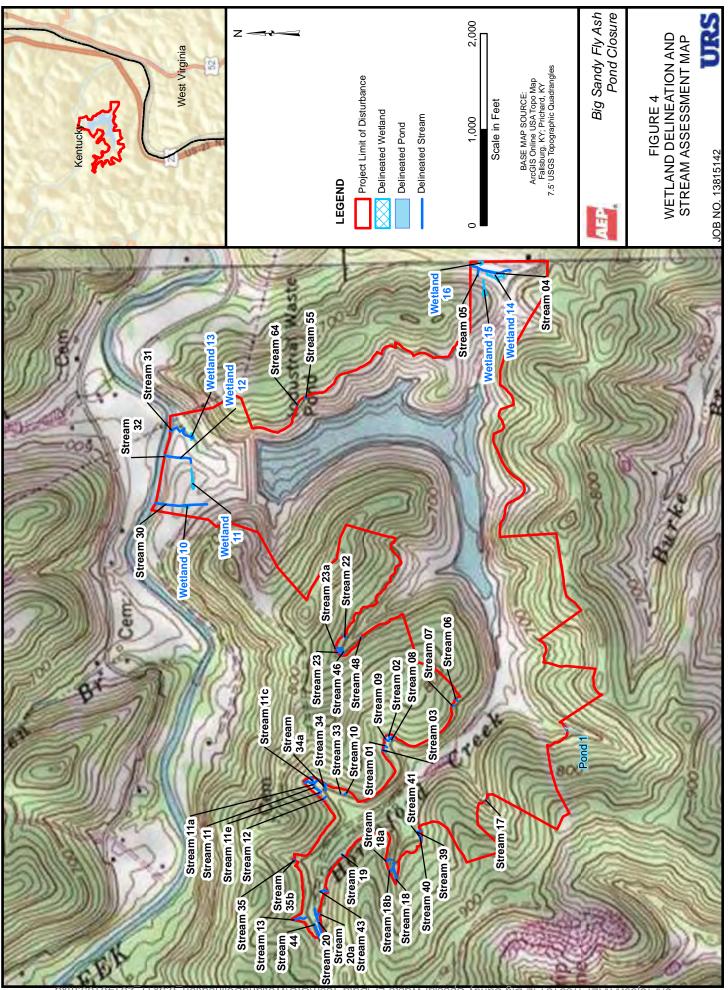




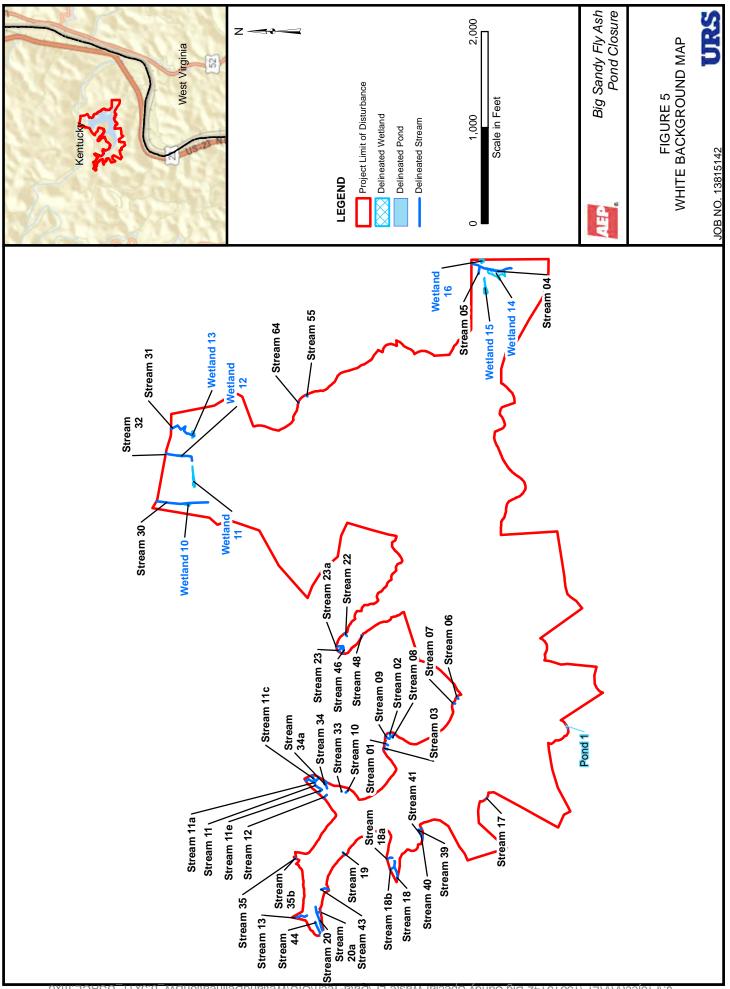




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BIG SANDY FLY ASH POND CLOSURE PROJECT

WETLAND DELINEATION AND STREAM ASSESSMENT REPORT

Prepared for: American Electric Power 1 Riverside Plaza Columbus, Ohio 43215





525 Vine Street, Suite 1800 Cincinnati, Ohio 45202

May 2013



TABLE OF CONTENTS

1.0	INTR	ODUCT	ION	1
2.0	METH	HODOL	DGY	1
	2.1		AND DELINEATION	
		2.1.1	SOILS	
		2.1.2	HYDROLOGY	
		2.1.3	VEGETATION	
		2.1.4	WETLAND CLASSIFICATIONS	
		2.1.5	OHIO RAPID ASSESSMENT METHOD V. 5.0	5
			pry 1 Wetlands	
		0	pry 2 Wetlands	
			pry 3 Wetlands	
	2.2		AM ASSESSMENTS	6
		2.2.1	USACE FUNCTIONAL ASSESSMENT OF HIGH-GRADIENT	
			EPHEMERAL AND INTERMITTENT HEADWATER STREAMS IN	-
			WESTERN WEST VIRGINIA AND EASTERN KENTUCKY	
		2.2.2	U.S. EPA RAPID BIOASSESSMENT PROTOCOLS FOR USE IN	0
			STREAMS AND WADEABLE RIVERS	8
3.0	RESU	LTS		8
	3.1	WETL	AND DELINEATION	
		3.1.1	Preliminary Soils Evaluation	
		3.1.2	National Wetland Inventory Map Review	
		3.1.3	Delineated Wetlands	
		3.1.4	Delineated Wetlands ORAM V5.0 Results	
	3.2		NEATED STREAMS	11
		3.2.1	Functional Assessment Of High-Gradient Ephemeral And Intermittent	10
		2 2 2 2	Headwater Streams In Western West Virginia And Eastern Kentucky	12
		3.2.2	Rapid Bioassessment Protocols For Use In Streams And Wadeable	12
	3.3	DELIN	Rivers VEATED PONDS	
4.0	SUM	MARY		14
5.0	REFE	RENCES	5	16



TABLES

Number

Table 1	Soil Map Units and Descriptions For The Big Sandy Fly Ash Pond Closure
	Project Survey Area
Table 2	Vegetation Identified Within The Big Sandy Fly Ash Pond Closure Project
	Survey Area Delineated Wetlands
Table 3	NWI Wetlands Within The Big Sandy Fly Ash Pond Closure Project Survey Area
Table 4	Delineated Wetlands Within The Big Sandy Fly Ash Pond Closure Project Survey
	Area
Table 5	Delineated Streams Within The Big Sandy Fly Ash Pond Closure Project Survey
	Area
Table 6	Delineated Ponds Within The Big Sandy Pond Closure Project Survey Area

FIGURES

Number

1	Overview Map
2	National Wetland Inventory and Soil Map Units Map
3A through 3K	Wetland Delineation and Stream Assessment Map



APPENDICES

Appendix

- A U.S. Army Corps of Engineers Wetland Forms
- B Ohio EPA Wetland ORAM Forms
- C USACE Functional Assessment of High-Gradient and Intermittent Headwater Streams
- D USEPA Rapid Bioassessment Stream Forms
- E Delineated Features Photographs
 - E1 Wetlands
 - E2 Streams
 - E3 Ponds





LIST OF ACRONYMS and ABBREVIATIONS

AEP	American Electric Power, Incorporated
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PHWH	Primary Headwater Habitat
PSS	Palustrine scrub/shrub
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey





1.0 INTRODUCTION

Kentucky Power Company, a unit of American Electric Power (AEP), is proposing to permanently close the Big Sandy Fly Ash Pond located in Lawrence County, Kentucky. AEP owns and operates the 1,097 MW Big Sandy Plant on the west bank of the Big Sandy River near Louisa, Kentucky. Currently, coal combustion fly ash from the plant is disposed in the Big Sandy Fly Ash reservoir, which is impounded by the Horseford Creek Dam located approximately 0.75-mile northwest of the plant. In expectation of future Federal Regulations pertaining to wet ash impoundments, AEP is proposing the design closure of the Plant's 130 acre wet fly ash impoundment; which is referred to as the Big Sandy Fly Ash Pond Closure Project ("Project"). AEP is proposing the completion of the Project since the fly ash pond will no longer be needed for wet sluice disposal beginning in 2016. It is AEP's desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond. The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE). An overview of the wetland delineation limits for the proposed Project is illustrated on Figure 1.

Land uses within the Project survey area were assigned a general classification based upon the principal land characteristics of the location as observed from within a given area, aerial photograph review, and field surveys. General land use types within the Project survey area include: wooded uplands (young to mature oak-mixed mesophytic forests and young maple-mixed mesophytic forests), wetlands, and fly ash pond. Wooded uplands are the most dominant land use along the Project.

2.0 METHODOLOGY

The purpose of the field survey was to assess whether wetlands and other "waters of the U.S." exist within the approximately 602 acre Project survey area. Prior to conducting field surveys, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed as part of the process to determine the occurrence and location of potential wetland areas.

In May, June, and October 2012, URS biologists walked the Project study area to conduct a wetland delineation and stream assessment. The study area was determined by using the approximate limit of disturbance for the pond closure excavation activities.

During field surveys, the physical boundaries of observed water features were recorded using sub-meter accurate Trimble Global Positioning System (GPS) units. The GPS data was then imported in to ArcMap GIS software where the data was then reviewed and edited for errors.



The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which URS is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of URS.

2.1 WETLAND DELINEATION

The Project survey area was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual (1987 Manual) (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (Regional Supplement) (USACE, 2012). The Regional Supplement was released in April 2012 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The 1987 Manual and Regional Supplement define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data were not available for any of the identified wetlands, URS utilized the routine delineation method described in the *1987 Manual* and *Regional Supplement* that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. The methodology used to examine each parameter is described in the following sections. The results of the wetland delineation are presented in Section 3.1 and completed USACE forms recorded for delineated wetlands at the site are provided in Appendix A.

2.1.1 SOILS

Soils were examined using a spade shovel to extract soil samples. The soils were examined for hydric soil characteristics. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 2000) was used to identify the hue, value, and chroma of the matrix and mottles of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987). In





sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

Seven map units from one soil series and three soil series complexes are mapped within the Project survey area (USDA, 2013). Table 1 provides a list of these soil map units along with their basic attributes.

According to the *Web Soil Survey* (USDA, 2013) and the NRCS Hydric Soils List of Kentucky, there are no soil map units within the Project survey boundary listed as containing any hydric component.

2.1.2 HYDROLOGY

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The *Regional Supplement* states that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth) is 41 degree Fahrenheit (°F) or higher as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28°F air temperature in the spring and fall, respectively. The National Weather Service WETS data obtained from the NRCS National Water and Climate Center did not identify any growing season records for Lawrence County. The nearest county to the Project area, Boyd County, was identified with data indicating that in an average year, this period lasts from April 18 to October 22, or 187 days. Based on this information it is estimated that in the Project area, five percent of the growing season equates to approximately 9 days.

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement*. Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as,





drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2011).

Review of USGS watershed data indicates that the Project is located within the Big Sandy River watershed (USGS, 2012). Within the Big Sandy River watershed, the Project study area is also within two minor watersheds; Blaine Creek and Big Sandy River.

2.1.3 VEGETATION

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the U.S. Army Corps of Engineers *2012 National Wetland Plant List: Eastern Mountains and Piedmont Region*, which encompasses the area of the Project. An area is determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the dominance test, the FAC-Neutral test and prevalence tests are used to determine if a wetland has a predominance of hydrophytic vegetation. Recent USACE guidance indicates that to the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year (USACE, 2012). Table 2 lists the vegetation that was identified in delineated wetlands during field surveys.

2.1.4 WETLAND CLASSIFICATIONS

Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). All identified wetlands within the survey area were classified as freshwater, Palustrine systems, which include all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Three Palustrine wetland classes were identified within the Project survey area. The three classes are as follows:

- **PEM** Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
- *PSS* Scrub/shrub wetlands are characterized by woody vegetation that is less than 3 inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody

4





angiosperms (i.e. small trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

• **PFO** – Forested wetlands are characterized by woody vegetation that is 3 inches or more DBH, regardless of height. The woody angiosperms (i.e. trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

2.1.5 OHIO RAPID ASSESSMENT METHOD V. 5.0

Since Kentucky does not have a functional assessment protocol for evaluating wetlands, the USACE Louisville district requested that URS ecologists follow the Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM). The ORAM method was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v. 5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Categories 2 and 3" from 60 to 64.9. However, according to the Ohio EPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001). The ORAM scores for the wetlands that were delineated are discussed in Section 3.1.4 of this report.

Category 1 Wetlands

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and typically do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or is of low ecological functionality.

Category 2 Wetlands

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the





presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past, but have been degraded to Category 2 status.

Category 3 Wetlands

Wetlands that are assigned to Category 3 have "...superior habitat, or superior hydrological or recreational functions." They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. It is important to stress that a wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit "superior" hydrologic functions (e.g. flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

2.2 STREAM ASSESSMENTS

Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). As defined in Title 33 Code of Federal Regulations (CFR) 328.3(e), the term OHWM means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area (33 CFR 328.3e, 1993). Although not exhaustive, USACE Regulatory Guidance Letter No. 05-05 (RGL05-05) identifies 15 characteristics of a OHWM such as natural line impressed on the bank, shelving, changes in the soil character, scour and several other indicators (USACE, 2005). RGL05-05 recommends that two or more characteristics be used to make the OHWM determination unless there is particularly strong evidence for one.

Stream assessments were conducted using the methods described in the USACE's *Operational Draft Regional Guidebook for the Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky* (USACE, 2010) and the U.S. EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition* (Barbour et al. 1999).



6



2.2.1 USACE FUNCTIONAL ASSESSMENT OF HIGH-GRADIENT EPHEMERAL AND INTERMITTENT HEADWATER STREAMS IN WESTERN WEST VIRGINIA AND EASTERN KENTUCKY

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value.

The headwater streams located within the Project area were evaluated using the USACE's *Operational Draft Regional Guidebook for the Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky* (USACE, 2012). This Regional Guidebook indicates the objective of this method is to meet the needs of federal and state agencies for a procedure to assess potential impact and mitigation reaches of streams in eastern Kentucky and western West Virginia.

This assessment method relies on 11 variables to assess the functions of headwater streams within eastern Kentucky and western West Virginia that include channel canopy cover, channel substrate embeddedness, channel substrate size, potential channel bank erosion, large woody debris, riparian/buffer zone tree diameter, riparian/buffer zone snag density, riparian/buffer zone species richness, riparian/buffer zone soil detritus, riparian/buffer zone herbaceous cover, and watershed land-use.

The objective of the stream analysis is to create baseline conditions of the function of the streams within an area and to be able to compare the difference between pre-project and post-project conditions. This functional difference represents the potential loss or gain of functional capacity of the streams as a result of the Project.

Completed USACE high-gradient ephemeral and intermittent headwater stream forms are provided in Appendix C. Results of the high-gradient ephemeral and intermittent headwater stream assessments are discussed in Section 3.2.1 of this report.



URS

2.2.2 U.S. EPA RAPID BIOASSESSMENT PROTOCOLS FOR USE IN STREAMS AND WADEABLE RIVERS

Streams within the Project survey corridor that were identified as perennial, containing substrate dominated by 50 percent or greater bedrock within the stream reach, containing major hydrologic inputs from groundwater, or an estimated gradual slope of four percent or less were not evaluated using the USACE's Functional Assessment of High-Gradient Ephemeral and Intermittent streams since the methodology was not intended for assessment of these types of streams. The stream assessment for these streams was conducted using the methods described in the U.S. EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition* (Barbour et al. 1999). The protocols include a method for habitat assessment that is calibrated to the stream's biological condition, which is abbreviated as the "HABSCORE". The HABSCORE is an independent, non-invasive, repeatable procedure for statistically defensible biological surveys. It provides a method to assess the quality of instream and riparian habitat. The assessed stream locations within the Project survey area are included on Figures 3A and 3K.

HABSCORE relies on visual observations of 10 parameters including substrate type, embeddedness, sediment deposition, water velocity, flow status, channel alteration, general morphology, bank stability, riparian zone vegetation quantity and width to provide an overall assessment of the sampling site. The 200-point system is broken down into four categories: Optimal (160-200), Sub-Optimal (110-159), Marginal (60-109), and Poor (<60). The form includes nonparametric factors for basic water quality measurements, dominant plant species, land uses, non-point sources of pollution, woody debris, sediment odors, presence of oils and black deposits, among others. The protocols also distinguish between high-gradient and low-gradient streams with different forms for each. Results of the rapid bioassessment are discussed in Section 3.2.2 of this report

3.0 RESULTS

Within the 602 acre Project study area, URS delineated 17 wetlands, 154 streams, and one pond. The delineated wetlands and other water features are discussed in detail in the following sections.

3.1 WETLAND DELINEATION

The locations, approximate extents, and acreages of the wetlands delineated within the Project survey area are shown on Figures 3A and 3K. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.



3.1.1 Preliminary Soils Evaluation

According to the USDA/NRCS Web Soil Survey of Lawrence County, Kentucky (USDA 2013) and the NRCS Hydric Soils List of Kentucky, one soil series and three soil series complexes are mapped within the Project survey area. No soil series within the Project survey area was identified with any hydric soil map units (NRCS, 2012). Soils in each wetland were observed and documented as part of the delineation methodology. Soil series located within the Project survey area within the Project survey area are shown on Figures 2. Table 1 provides a detailed overview of all soil series within the Project survey area.

3.1.2 National Wetland Inventory Map Review

National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. The USFWS website states that the NWI maps are not intended or designed for jurisdictional wetland identification or location. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI maps of the Fallsburg and Prichard, Kentucky quadrangles, the Project survey area contains three mapped NWI wetlands: one Palustrine Emergent Persistent Semipermanently Flooded Diked/Impounded wetland (PEM1Fh), one Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded (L1UBHh) feature, and one Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded (PUBHh) wetland (USFWS, 2012). Summary information on NWI mapped wetlands is presented in Table 3 and shown on Figure 2.

3.1.3 Delineated Wetlands

The delineation identified a total of 17 wetlands, totaling 1.64 acres, within the Project survey area as shown in Table 4. The 17 wetlands are of three different wetland habitat types: 11 PEM wetlands, five PEM/PSS wetlands, and one PFO wetland. See Table 3.1.3 for a summary of the delineated wetlands.

The locations, approximate extents, and acreages of the wetlands identified within the survey areas are shown on Figures 3A and 3K. Completed USACE wetland delineation forms are



provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.

TABLE 3.1.3 SUMMARY OF DELINEATED WETLANDS WITHIN THE BIG SANDY POND CLOSURE PROJECT SURVEY AREA

Cowardin Wetland Type ^a	ORAM Category 1	ORAM Category 2	ORAM Category 3	Number of Wetlands	Acreage within Survey Corridor
PEM	11	0	0	11	0.65
PEM/PSS	2	3	0	5	0.44
PFO	0	1	0	1	0.55
Total	13	4	0	17	1.64

Cowardin Wetland Type^a: PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested

3.1.4 Delineated Wetlands ORAM V5.0 Results

Within the Project survey area, 13 of the 17 wetlands are Category 1 wetlands, while the remaining four wetlands are Category 2 wetlands. No Category 3 wetlands were identified within the Project survey area. Wetland 15 had the lowest ORAM score, 21.5, while Wetland 14 had the highest score, 47. Completed ORAM forms for the wetlands are provided in Appendix B.

Category 1 Wetlands

Thirteen Category 1 wetlands, totaling 0.75 acre, were delineated within the Project survey area. The Category 1 wetlands were identified as 11 PEM wetlands (0.65 acre) and two PEM/PSS wetlands (0.12 acre). The highest Category 1 ORAM score was 29 (Wetland 13), and the lowest ORAM score was 21.5 (Wetland 15). These wetlands typically exhibited narrow upland buffers and intensive use of adjacent upland areas (fly ash pond), exhibited limited plant community development with a moderate to high percentage of invasive species, and characteristically had habitat and hydrology in the early stages of recovering from previous manipulation because of farming or other disturbances.

Category 2 Wetlands

Four Category 2 wetlands, totaling 0.87 acre, were delineated within the Project survey area. The four Category 2 wetlands were identified as three PEM/PSS wetlands (0.32 acre) and one



PFO wetland (0.55 acre). The highest scoring Category 2 wetland was 47 (Wetland 14), and the lowest was 32.5 (Wetland 16). The Category 2 wetlands generally exhibited fair to moderate plant communities with few invasive species, low to moderate plant community interspersion, low to high intensity surrounding land use (e.g. young second growth woodlots, shrub-land, etc.), and recovering and/or recovered natural hydrology and habitat.

Category 3 Wetlands

No Category 3 wetlands were delineated within the Project survey area.

3.2 DELINEATED STREAMS

URS identified 154 streams, totaling 42,420 linear feet, within the Project survey area as listed in Table 5. The locations of streams identified within the survey area are shown on Figures 3A through 3K. See Table 3.2 for a summary of the delineated streams.

The 154 streams assessed are composed of 136 ephemeral streams, 15 intermittent streams, and three perennial streams. Eleven streams were assessed using the U.S. EPA's RBA methodology, while the remaining 143 were assessed using the USACE HGM methodology (high gradient ephemeral and intermittent streams).

Review of USGS watershed data indicates that the Project is located within the Big Sandy River watershed (USGS, 2012). Within the Big Sandy River watershed, the Project study area is also within two minor watersheds; Blaine Creek and Big Sandy River.

Most assessed streams within the survey area appear to be tributaries that flow into or combine with other streams (waters of the U.S) and connect to Blaine Creek below the fly ash pond. A small area located at the southwest corner of the survey area contains tributaries that flow directly into the Big Sandy River.

Flow Type	RBA Assessed Streams	High Gradient Stream Assessed Streams	Number of Streams	Linear Feet within Survey Area
Ephemeral	1	135	136	25,696
Intermittent	7	8	15	12,406
Perennial	3	0	3	4,318
Total	11	143	154	42,420

TABLE 3.2 SUMMARY OF DELINEATED STREAMS WITHIN THE BIG SANDY POND CLOSURE PROJECT SURVEY AREA



3.2.1 Functional Assessment Of High-Gradient Ephemeral And Intermittent Headwater Streams In Western West Virginia And Eastern Kentucky

Within the Project survey area, 143 streams were evaluated using the Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Streams in western West Virginia and eastern Kentucky method. The overall landscape and habitat functions of various streams within the Project survey area were observed having comparable resemblance in various areas of the property. Based on the landscape and habitat evaluation conducted by URS during the field survey, it was determined that seven separate stream habitat areas (SHA) exist within the Project survey area. The stream habitat area groupings were developed based on observed differences in habitat including topography, geology, slope, streamflow, and biological characteristics.

Stream Habitat Area 1: There are 20 streams within SHA 1. The canopy of SHA 1 is completely closed to partially open from the mature trees that surround the streams. There is also very little understory growth and very little to no herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location were on gentle slopes near the confluence with the main channel.

Stream Habitat Area 2: There are 10 streams within SHA 2. Most streams assessed in this location were on steep slopes that originate near the top of the ridge and extend downstream to where the hillside has been cut out for the perimeter road around the fly ash pond. The canopy of SHA 2 is completely closed near the top of the hill; however, there is less canopy cover at the downhill extents due to the fly ash pond. There is also little to moderate understory growth and very little herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. The streams do not directly connect to the fly ash pond.

Stream Habitat Area 3: There are 12 streams within SHA 3. Most streams assessed in this location were on steep slopes that appear to have been modified through tree removal, cut/fill material and landslides. The canopy of SHA 3 is completely open near the top of the streams, however, there is more canopy cover within the downhill extents due to the lack of clearing. There is moderate to heavy understory growth and moderate to heavy herbaceous growth. Most of the substrate was comprised of sand, silt, and some gravel.

Stream Habitat Area 4: There are 25 streams within SHA 4. The canopy of SHA 4 is completely closed to partially open from the mature trees that surround the streams. There is also very little understory growth and very little to no herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location of the property originate near the ridge tops and extend down to the fly ash pond.





Stream Habitat Area 5: There are 29 streams within SHA 5. The canopy of SHA 5 is completely closed to partially open from the mature trees and understory that surround the streams. There is moderate to thick understory growth from what appears to be previous logging or other disturbances, and little herbaceous growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most streams assessed in this location of the property originate near the ridge tops and extend down to intermittent streams, perennial streams, or the fly ash pond.

Stream Habitat Area 6: There are 23 streams within SHA 6. Most streams assessed in this location were on steep slopes that originate near the top of the ridges and extend downstream to where the hillsides have been cut out for the perimeter road around the fly ash pond. The canopy of SHA 6 is completely closed near the top of the hillsides, however, there is less canopy cover at the downhill extents due to the fly ash pond. This part of the property appears to have undergone some selective logging within the past 20-40 years and has created moderate to thick understory growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Most of the streams do not directly connect to the fly ash pond.

Stream Habitat Area 7: There are 24 streams within SHA 7. Most streams assessed in this location were on steep slopes that originate near the top of benches or ridges and extend downstream to a perennial stream. The canopy of SHA 7 is completely closed due to the mature forest. There is little to no understory growth. Most of the substrate was comprised of sand, silt, some gravel and occasionally large rock particles. Near the confluence with the main channel, most streams had some larger substrate.

A form representing each of the stream habitat areas assessed using the Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Stream method is provided in Appendix C. Color photographs were taken of a representative sample of the streams during the field survey and are provided in Appendix E2.

3.2.2 Rapid Bioassessment Protocols For Use In Streams And Wadeable Rivers

Eleven streams were assessed using the U.S. EPA's Rapid Bioassessment method within the approximately 602-acre Project survey area. Field surveys within the Project survey area indicated these 11 streams, totaling 13,171 linear feet, were classified as one Optimal stream, four Sub-Optimal streams, and six Marginal streams. The designations for each of these stream types are described below.

A Rapid Bioassessment form for each stream is provided in Appendix D. Color photographs were taken of each stream during the field survey and are provided in Appendix E2.





Poor Streams – No Poor streams were identified within the survey area.

Marginal Streams – Six Marginal streams, totaling 5,580 linear feet, were identified during the field investigations and have scores that range between 62 (Stream 32) and 103 (Stream 4). The Marginal streams located within the Project survey area consisted of one ephemeral stream, four intermittent streams, and one perennial stream. The substrates of these streams were generally dominated by gravel and silt, with lesser amounts of cobble and boulder. The streams showed evidence of moderate epifaunal substrate, low pool variability, channel alteration, and a small riparian vegetative zone.

Sub-Optimal Streams – Four Sub-Optimal streams, totaling 6,210 linear feet, were identified during the field investigations and have scores that range between 112 (Stream 18) and 144 (Stream 15). The Sub-Optimal streams consisted of three intermittent streams and one perennial stream. The substrates of these streams were generally dominated by cobble, gravel, and boulder, with lesser amounts of sand, silt, and clay. The streams showed evidence of good epifaunal substrate, good pool variability, minimal channel alteration, good amount of riffles, and a riparian vegetative zone.

Optimal Streams – One Optimal stream totaling 1,381 linear feet was identified during the field investigations. Stream 68 is a perennial stream that received a score of 167. The substrate of the stream was generally dominated by boulder, cobble, gravel, with lesser amounts of bedrock and sand. The stream showed evidence of good epifaunal substrate, good pool variability, no channel alteration, good amount of riffles, and a riparian vegetative zone.

3.3 DELINEATED PONDS

One pond totaling 0.24 acre was identified within the Project survey area (Table 6). The pond appears to be man-made and used for stormwater control. The location of the pond identified within the Project survey area is shown on Figure 3I. A representative color photograph was taken of the pond during the field survey and is provided in Appendix E3.

4.0 SUMMARY

The delineation of the approximately 602 acre Project survey area identified a total of 17 wetlands, totaling 1.64 acres. The 17 wetlands are of three different wetland habitat types: 11 PEM wetlands, five PEM/PSS wetlands, and one PFO wetland. Of these wetlands, 13 wetlands are Category 1 wetlands and four wetlands are Category 2 wetlands. No Category 3 wetlands were identified within the Project survey boundary.





Field surveys identified 154 streams within the Project survey area totaling approximately 42,420 linear feet. The 154 streams were composed of 136 ephemeral streams, 15 intermittent streams, and three perennial streams. Eleven streams were assessed using the U.S. EPA's RBA methodology, while the remaining 143 were assessed using the USACE's Functional Assessment of High-Gradient Ephemeral and Intermittent Headwater Streams.

One pond totaling 0.24 acre was identified within the Project survey area and appears to be manmade for stormwater control use.



15



5.0 REFERENCES

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C.
- Environmental Laboratory. 1987. U.S. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station: Vicksburg, Mississippi.
- Fritz, K.M., Johnson, B.R., and Walters, D.M. 2006. Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams. EPA/600/ R-06/126. U.S. Environmental Protection Agency, Office of Research and Development, Washington DC.
- Kollmorgen Corporation. 2000. Munsell Soil Color Charts. Baltimore, Maryland.
- Mack, John J. 2001. Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Ohio EPA Technical Report WET/2001-1. Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, Columbus, Ohio.
- U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: : Eastern Mountains and Piedmont Region (Version 2.0), ed. J.R. Berkowitz, J. S. Wakeley, R. W. Lichvar, and C. V. Noble, ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers. 2012. National Wetland Plant List Kentucky, Eastern Mountains and Piedmont Region. http://rsgisias.crrel.usace.army.mil/NWPL/index.html: Accessed 11/5/12
- U.S. Army Corps of Engineers, 2010. Operational Draft Regional Guidebook for the Functional Assessment of High-gradient Ephemeral and Intermittent Headwater Streams in Western West Virginia and Eastern Kentucky, ed. C. V. Noble, J.R. Berkowitz, and J. Spence, ERDC/EL TR-10-11. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers. 2005. Regulatory Guidance Letter No. 05-05: Guidance on Ordinary High Water Mark Identification.
- U.S. Department of Agriculture, Natural Resources Conservation Service, 2012. National Hydric Soils List by State. Available online at <u>ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/hydric_soils.xlsx</u>. Accessed 10/04/12.



- U.S. Department of Agriculture, Natural Resources Conservation Service. 2012. Web Soil Survey (GIS Shapefile). http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm Accessed 10/4/12
- U.S. Fish and Wildlife Service. 2012. National Wetlands Inventory Branch of Resource and Mapping Service. <u>http://137.227.242.85/Data/interpreters/wetlands.aspx</u>U.S. Fish and Wildlife Service. 2012. National Wetlands Inventory Branch of Resource and Mapping Service. <u>http://www.fws.gov/wetlands/FAQs.html Accessed 10/04/12</u>
- U.S. Fish and Wildlife Service. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition (Barbour et al. 1999).
- U.S. National Archives and Records Administration. 1993. Code of Federal Regulations. Title 33. Navigation and Navigable Waters.
- University of Kentucky (UK). 2012. Kentucky 14-digit Sub watersheds (GIS Shapefile). http://www.uky.edu/KGS/gis/hucs.htm. Accessed 11/14/2012.





	SOIL MA	SOIL MAP UNITS AND DESCRIPTIONS FOR THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA	SANDY FLY ASH PON	ND CLOSURE PROJEC	CT SURVEY	AREA	
Soil Series	Symbol	Map Unit Description	Percent of Survey Area by Series	Topographic Setting	Hydric	Hydric Component (%)	
Dumps	Dm	Dumps, mine; tailings; and tipples	26	Flyash pond	Not hydric	N/A	
Grigsby	Gf	Grigsby fine sandy loam, frequently flooded	1	Floodplain	Not hydric	N/A	
Shelocta	ShF	Shelocta-Hazleton-Fedscreek complex, 30 to 60 percent slopes, stony	7	Hillslopes	Not hydric	N/A	
	UpD	Upshur-Rarden complex, 12 to 25 percent slopes	ω	Hillslopes	Not hydric	N/A	
Opsilui	UpF	Upshur-Rarden complex, 25 to 60 percent slopes, rocky	25	Hillslopes	Not hydric	N/A	
Vandalia	VaF	Vandalia-Beech complex, 20 to 60 percent slopes, stony	36	Hillslopes	Not hydric	N/A	
A anuana	VaF2	Vandalia-Beech complex, 20 to 60 percent slopes, stony, eroded	2	Hillslopes	Not hydric	N/A	

TABLE 1

NOTES: (1) Data sources include: USDA, NRCS. 2013 Soil Survey Geographic (SSURGO) Database. Avialable online at: http://soildatamart.nrcs.usda.gov/

USDA, NRCS. April 2012. National Hydric Soils List by State. Available online at: http://soils.usda.gov/use/hydric/lists/state.html





TABLE 2

VEGETATION IDENTIFIED WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT DELINEATED WETLANDS

Common Name	Scientific Name	Stratum ^a	Eastern Mountains and Piedmont Supplement Indicator Status ^b
Allegheny Blackberry	Rubus allegheniensis	S	FACU
American Elm	Ulmus americana	Т	FACW
American Sycamore	Platanus occidentalis	S & T	FACW
Beggarticks sp.	Bidens spp.	Н	FAC
Black Willow	Salix nigra	S & T	OBL
Broad-Leaf Cat-Tail	Typha latifolia	Н	OBL
Canadian Goldenrod	Solidago canadensis	Н	FACU
Common Boneset	Eupatorium perfoliatum	S	FACW
Common Fox Sedge	Carex vulpinoidea	Н	OBL
Cottongrass Bulrush	Scirpus cyperinus	Н	FACW
Creeping-Jenny	Lysimachia nummularia	Н	FACW
Curly Dock	Rumex crispus	Н	FAC
Dark-Green Bulrush	Scirpus atrovirens	Н	OBL
Deer-Tongue Rosette Grass	Dichanthelium clandestinum	Н	FAC
Green Ash	Fraxinus pennsylvanica	S & T	FACW
False Nettle	Boehmeria cylindrica	Н	FACW
Hop Sedge	Carex lupulina	Н	OBL
Japanese Stilt Grass	Microstegium vimineum	S	FAC
Knotty-Leaf Rush	Juncus acuminatus	Н	OBL
Lamp Rush	Juncus effusus	Н	FACW
Lesser Poverty Rush	Juncus tenuis	Н	FAC
Little False Bluestem	Schizachyrium scoparium	Н	FACU
Narrow-Leaf Cat-Tail	Typha angustifolia	Н	OBL
Needle Spike-Rush	Eleocharis acicularis	Н	OBL
Pennsylvania Smartweed	Polygonum pensylvanicum	Н	FACW
Pointed Broom Sedge	Carex scoparia	Н	FACW
Poison Ivy	Toxicodendron radicans	Н	FAC
Purple-Stem American-Aster	Symphyotrichum puniceum	Н	OBL
Red-Root Flat Sedge	Cyperus erythrorhizos	Н	FACW
River Birch	Betula nigra	Т	FACW
Sallow Sedge	Carex lurida	Н	OBL
Seedbox	Ludwigia alternifolia	Н	FACW
Sensitive Fern	Onoclea sensibilis	Н	FACW
Silver Maple	Acer saccharinum	Т	FACW
Single-Vein Sweetflag	Acorus calamus	Н	OBL
Small-Spike False Nettle	Boehmeria cylindrica	Н	FACW
Sphagnum Moss	Sphagnum spp.	Н	NI
Spotted Touch-Me-Not	Impatiens capensis	Н	FACW





TABLE 2

VEGETATION IDENTIFIED WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT DELINEATED WETLANDS

Common Name	Scientific Name	Stratum ^a	Eastern Mountains and Piedmont Supplement Indicator Status ^b
Spotted Trumpetweed	Eutrochium maculatum	Н	FACW
Squarrose Sedge	Carex squarrosa	Н	FACW
Swamp Rose	Rosa palustris	S	OBL
Sweet-Scented Joe-Pye-Weed	Eutrochium purpureum	Н	FAC
White Grass	Leersia virginica	Н	FACW
White Turtlehead	Chelone glabra	Н	OBL
Yellow Bristle Grass	Setaria pumila	Н	FAC

^a H = herb, S = shrub or sapling, T = tree, V = vine

 <u>Wetland Indicator Status</u>
 OBL - Obligate Wetland - Occurs almost always (99% probability) in wetlands FACW - Facultative Wetlands - Usually occurs in wetlands (67 - 99% probability) FACU - Facultative Wetahas - Ostariy occurs in wetahas (07 - 99% probability) FAC - Facultative - Equally likely to occur in wetlands or non-wetlands (34 - 66% probability) FACU - Facultative Upland - Usually occurs in non-wetlands (67 - 99% probability) UPL - Obligate Upland - Occurs almost always in non-wetlands (99% probability) NI - No Indicator - There is insufficient information on habitat preference





TABLE 3

NWI WETLANDS WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA

Wetland Type	NWI Code	NWI Habitat Type ¹	Total Number of Each Habitat Type	NWI Quadrangle
Freshwater Emergent Wetland	PEM1Fh	Palustrine Emergent Persistent Semipermanently Flooded Diked/Impounded	1	Fallsburg
Lake	L1UBHh	Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded	1	Fallsburg
Freshwater Pond	PUBHh	Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded	1	Fallsburg
Total Number of NWI Wetlands = 3	VI Wetlands -	= 3		

Total Number of PEM = 1, PFO = 0, PSS = 0, PUB = 1, R = 0, L = 1

NWI Habitat Type¹ : USFWS National Wetlands Inventory Classification De-coder: http://137.227.242.85/Data/interpreters/wetlands.aspx





DEL	INEATED WET	TANDS WITHIN	N THE BIG SANDY F	DELINEATED WETLANDS WITHIN THE BIG SANDY FLY ASH POND CLOSURE PROJECT SURVEY AREA	URE PROJECT SURV	VEY AREA
Wetland Name	Latitude	Longitude	Cowardin Wetland Type ^a	ORAM Score	ORAM Category	Acreage within Survey Corridor
Wetland 01	38.185144	-82.65042	PEM/PSS	23	1	0.06
Wetland 02	38.184948	-82.650542	PEM	23	1	0.03
Wetland 03	38.184148	-82.64005	PEM	22	1	0.08
Wetland 04	38.184414	-82.640347	PEM	23	1	0.14
Wetland 05	38.18358	-82.639877	PEM	24	1	0.11
Wetland 06	38.185745	-82.637086	PEM/PSS	40	2	0.03
Wetland 07	38.182916	-82.638806	PEM	28.5	1	0.07
Wetland 08	38.18342	-82.638723	PEM	27.5	1	0.04
Wetland 09	38.185936	-82.635573	PEM/PSS	24	1	0.06
Wetland 10	38.187993	-82.633528	PEM	23	1	0.02
Wetland 11	38.187827	-82.632687	PEM	23	1	0.05
Wetland 12	38.188183	-82.631769	PEM	22	1	0.02
Wetland 13	38.187824	-82.631001	PEM	29	1	0.03
Wetland 14	38.179076	-82.625342	PEM/PSS	47	2	0.21
Wetland 15	38.179389	-82.625917	PEM	21.5	1	0.06
Wetland 16	38.179511	-82.624825	PEM/PSS	32.5	2	0.08
Wetland 17	38.185963	-82.625944	PFO	46	2	0.55
Total: 17	PEM: 11, PEM/PSS: 5,	/PSS: 5, PFO:1				1.64
		2004				

TABLE 4

Cowardin Wetland Typea : PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested



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EA	Linear Feet within Survey Area	402	176	411	157	313	3,343	0L	170	278	101	479	119	194	95	491	117	104	381	129	62	95	816	56	306	185	183	895	47	104
ROJECT SURVEY AR	Stream Quality or Habitat Area	Area 4	Marginal	Area 1	Area 4	Marginal	Area 5	Area 5	Area 5	Area 6	Sub-Optimal	Area 6	Area 6																	
OSURE P	Score ^b	NA	NA	NA	NA	NA	103	NA	96	NA	NA	NA	NA	144	NA	NA														
POND CL	Form Used ^a	HGS	HGS	HGS	HGS	HGS	RBA	HGS	RBA	HGS	HGS	HGS	HGS	RBA	HGS	HGS														
TABLE 5 ANDY PLANT	Flow Regime	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Ephemeral							
TABLE 5 DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA	Waterbody	Tributary to fly ash pond	Tributary to Blaine Creek	Tributary to Blaine Creek	Tributary to fly ash pond																									
EATED STRE	Longitude	-82.642085	-82.642209	-82.641507	-82.641158	-82.642327	-82.625015	-82.625246	-82.640554	-82.64076	-82.642054	-82.64174	-82.641687	-82.64161	-82.644132	-82.643639	-82.643544	-82.643781	-82.64308	-82.64252	-82.644005	-82.644254	-82.648905	-82.648927	-82.648953	-82.649453	-82.639347	-82.642819	-82.642261	-82.642182
DELIN	Latitude	38.18278	38.18292	38.182358	38.182345	38.182731	38.179875	38.179566	38.180497	38.18074	38.182257	38.182792	38.182594	38.182694	38.183665	38.184825	38.18441	38.184944	38.184638	38.184545	38.184364	38.184279	38.185593	38.185804	38.186405	38.186111	38.177507	38.17573	38.176481	38.176163
	Report Name	Stream 01	Stream 01a	Stream 02	Stream 02a	Stream 03	Stream 04	Stream 05	Stream 06	Stream 07	Stream 08	Stream 09	Stream 09a	Stream 09b	Stream 10	Stream 11	Stream 11a	Stream 11b	Stream 11c	Stream 11d	Stream 11e	Stream 12	Stream 13	Stream 13a	Stream 13b	Stream 13c	Stream 14	Stream 15	Stream 15a	Stream 15b



Big Sandy Fly Ash Pond Closure Project

Table 5 Page 1 of 6

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EA	Linear Feet within Survey Area	173	245	61	646	275	132	797	111	112	233	1,120	93	100	113	87	43	114	69	182	740	81	138	294	84	186	165	LL	177	415
TABLE 5 S WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA	Stream Quality or Habitat Area	Area 6	Sub-Optimal	Area 5	Area 3	Area 3	Area 3	Area 3	Marginal	Area 3																				
OSURE P	Score ^b	NA	112	NA	67	NA																								
POND CL	Form Used ^a	HGS	RBA	HGS	RBA	HGS																								
TABLE 5 ANDY PLANT	Flow Regime	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Ephemeral												
	Waterbody	Tributary to fly ash pond																												
DELINEATED STREAM	Longitude	-82.642318	-82.642329	-82.642651	-82.643729	-82.643372	-82.642599	-82.645326	-82.644962	-82.645296	-82.646264	-82.648104	-82.64647	-82.646877	-82.647548	-82.647975	-82.648736	-82.64916	-82.649426	-82.646425	-82.649346	-82.648381	-82.649448	-82.64961	-82.637508	-82.63824	-82.638926	-82.63877	-82.635548	-82.63839
DELINI	Latitude	38.176046	38.175778	38.175752	38.175687	38.175682	38.17767	38.179089	38.179664	38.179373	38.178786	38.18225	38.182426	38.182388	38.182425	38.182362	38.182258	38.182427	38.182275	38.183625	38.184248	38.184416	38.183988	38.183736	38.183258	38.183653	38.183783	38.183776	38.181997	38.182203
	Report Name	Stream 15c	Stream 15d	Stream 15e	Stream 15f	Stream 15g	Stream 16	Stream 17	Stream 17a	Stream 17b	Stream 17c	Stream 18	Stream 18a	Stream 18b	Stream 18c	Stream 18d	Stream 18e	Stream 18f	Stream 18g	Stream 19	Stream 20	Stream 20a	Stream 20b	Stream 20c	Stream 21	Stream 22	Stream 23	Stream 23a	Stream 24	Stream 25



Big Sandy Fly Ash Pond Closure Project

Table 5 Page 2 of 6

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EA	Linear Feet within Survey Area	178	154	185	138	558	371	315	64	141	100	561	211	78	280	171	279	169	157	652	56	114	368	2,379	554	633	232	93	432	48
TABLE 5 WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA	Stream Quality or Habitat Area	Area 1	Area 1	Area 1	Area 1	Marginal	Marginal	Marginal	Area 4	Area 6	Area 5	Area 5	Sub-Optimal	Area 5	Area 5	Area 5	Area 3	Area 3	Area 3											
OSURE P	Score ^b	NA	NA	NA	NA	89	62	80	NA	142	NA	NA	NA	NA	NA	NA														
POND CL	Form Used ^a	HGS	HGS	HGS	HGS	RBA	RBA	RBA	SDH	HGS	RBA	HGS	SDH	HGS	HGS	HGS	HGS													
ANDY PLANT	Flow Regime	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Perennial	Intermittent	Intermittent	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral	Intermittent	Ephemeral	Ephemeral	Ephemeral	Perennial	Ephemeral	Ephemeral	Ephemeral	Ephemeral	Intermittent	Ephemeral
	Waterbody	Tributary to Blaine Creek	Tributary to fly ash pond																											
DELINEATED STREAMS	Longitude	-82.624443	-82.624478	-82.624501	-82.624289	-82.633499	-82.630791	-82.631772	-82.6441	-82.643787	-82.643645	-82.646285	-82.645834	-82.6465	-82.638531	-82.642526	-82.644498	-82.645372	-82.645778	-82.645992	-82.646067	-82.648394	-82.647594	-82.649991	-82.650217	-82.653843	-82.653997	-82.637348	-82.638883	-82.635048
DELINE	Latitude	38.179403	38.179562	38.18034	38.180985	38.188125	38.188061	38.188102	38.183828	38.184202	38.184134	38.185591	38.185921	38.185204	38.177545	38.176969	38.17922	38.181365	38.1813	38.181378	38.18117	38.182146	38.184011	38.1842	38.18488	38.182484	38.181227	38.183078	38.18363	38.182258
	Report Name	Stream 26	Stream 27	Stream 28	Stream 29	Stream 30	Stream 31	Stream 32	Stream 33	Stream 34	Stream 34a	Stream 35	Stream 35a	Stream 35b	Stream 36	Stream 37	Stream 38	Stream 39	Stream 40	Stream 41	Stream 41a	Stream 42	Stream 43	Stream 44	Stream 44a	Stream 44b	Stream 44c	Stream 45	Stream 46	Stream 47



Big Sandy Fly Ash Pond Closure Project

Table 5 Page 3 of 6

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TABLE 5 DEI INFATED STREAMS WITHIN THE BIG SANDY PI ANT POND CI OSLIRE PROIECT SURVEV AREA

	DELIN	EATED STR	DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA	ANDY PLANT	POND CL	OSURE P	ROJECT SURVEY AR	EA
Report Name	Latitude	Longitude	Waterbody	Flow Regime	Form Used ^a	Score ^b	Stream Quality or Habitat Area	Linear Feet within Survey Area
Stream 48	38.183095	-82.638419	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	73
Stream 49	38.181963	-82.637701	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	109
Stream 50	38.185788	-82.635826	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	116
Stream 51	38.185756	-82.635877	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 3	75
Stream 52	38.181211	-82.628042	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	47
Stream 53	38.182467	-82.627866	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	64
Stream 54	38.182315	-82.627723	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	39
Stream 55	38.184567	-82.629622	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	88
Stream 56	38.178126	-82.633154	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	36
Stream 57	38.178022	-82.630229	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	43
Stream 58	38.174032	-82.647949	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	604
Stream 59	38.174786	-82.646863	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	881
Stream 59a	38.174412	-82.646894	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	304
Stream 60	38.176137	-82.646625	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	692
Stream 60a	38.175762	-82.647063	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	149
Stream 61	38.180213	-82.627552	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	31
Stream 62	38.182122	-82.627641	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	10 20
Stream 63	38.182254	-82.627658	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	LL
Stream 64	38.184825	-82.629898	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	LL
Stream 65	38.185999	-82.630599	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	19
Stream 66	38.186103	-82.630655	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 2	30
Stream 67	38.178037	-82.63036	Tributary to fly ash pond	Ephemeral	HGS	NA	Area 6	51
Stream 68	38.175615	-82.647681	Tributary to Fuller's Branch	Perennial	RBA	167	Optimal	1,381
Stream 68a	38.174678	-82.648721	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	92
Stream 68b	38.17473	-82.648255	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	62
Stream 68c	38.17447	-82.648223	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	224
Stream 68d	38.175023	-82.647836	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	158
Stream 68e	38.174797	-82.648466	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	69
Stream 68f	38.175329	-82.647784	Tributary to Fuller's Branch	Ephemeral	HGS	NA	Area 7	68

Big Sandy Fly Ash Pond Closure Project

> Table 5 Page 4 of 6



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TABLE 5	DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA
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Lin	Survey Area	130	200	104	102	139	65	85	204	256	58	251	266	412	442	75	310	1,816	262	131	548	440	81	222	175	210	336	108	385	36
Stream Quality or Hobitot A roo	Habitat Alca	Area 7	Area 5	Area 5	Area 5	Sub-Optimal	Area 5	Area 1																						
Score ^b		NA	NA	NA	NA	118	NA																							
Form	naen	HGS	HGS	HGS	HGS	RBA	HGS																							
Flow	Incgillic	Ephemeral	Intermittent	Ephemeral	Ephemeral	Intermittent	Ephemeral																							
titude Longitude Waterbody Flow Form Score ^b Stream Quality or 1		Tributary to Fuller's Branch	Tributary to fly ash pond	Tributary to Blaine Creek																										
Longitude		-82.648427	-82.647479	-82.648242	-82.647456	-82.647476	-82.647641	-82.647626	-82.647374	-82.647088	-82.647351	-82.646887	-82.647099	-82.648002	-82.650984	-82.651216	-82.650664	-82.653279	-82.652998	-82.653492	-82.654015	-82.654716	-82.655866	-82.655933	-82.624959	-82.625104	-82.626268	-82.626399	-82.626544	-82.625733
Latitude		38.174959	38.17541	38.17517	38.175685	38.175554	38.177244	38.177145	38.177322	38.176957	38.1764	38.176428	38.176653	38.176948	38.183888	38.183487	38.183499	38.185572	38.185856	38.18583	38.186375	38.1858	38.185899	38.185596	38.181433	38.182305	38.184755	38.185768	38.186226	38.185364
Report	LIAILLE	Stream 68g	Stream 68h	Stream 68i	Stream 68j	Stream 68k	Stream 681	Stream 68m	Stream 68n	Stream 680	Stream 68p	Stream 68q	Stream 68r	Stream 69	Stream 70	Stream 70a	Stream 70b	Stream 71	Stream 71a	Stream 71b	Stream 71c	Stream 71d	Stream 71e	Stream 71f	Stream 72	Stream 73	Stream 74	Stream 75	Stream 76	Stream 77

Big Sandy Fly Ash Pond Closure Project

Table 5 Page 5 of 6

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Report	DELIN	EATED STRI	DELINEATED STREAMS WITHIN THE BIG SANDY PLANT POND CLOSURE PROJECT SURVEY AREA	ANDY PLANT Flow	POND CL	OSURE P	ROJECT SURVEY ARI	EA Linear Feet within
Name	Latitude	Latitude Longitude	Waterbody	Regime	Used ^a	Score	Habitat Area	Survey Area
Stream 78	38.183861	-82.624616	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	354
Stream 78a		38.183771 -82.624265	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	120
Stream 78b	Stream 78b 38.183921 -82.62445	-82.62445	Tributary to Blaine Creek	Ephemeral	SDH	NA	Area 1	61
Stream 78c	38.184067	-82.624865	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	96
Stream 79		38.182304 -82.623863	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	542
Stream 79a		38.182473 -82.623487	Tributary to Blaine Creek	Ephemeral	SDH	NA	Area 1	391
Stream 79aa		38.182373 -82.622941	Tributary to Blaine Creek	Ephemeral	SDH	NA	Area 1	53
Stream 80		38.186308 -82.626727	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	132
Stream 80a	38.18624	-82.62678	Tributary to Blaine Creek	Ephemeral	HGS	NA	Area 1	80
Total: 154								42,420

TABLE 5

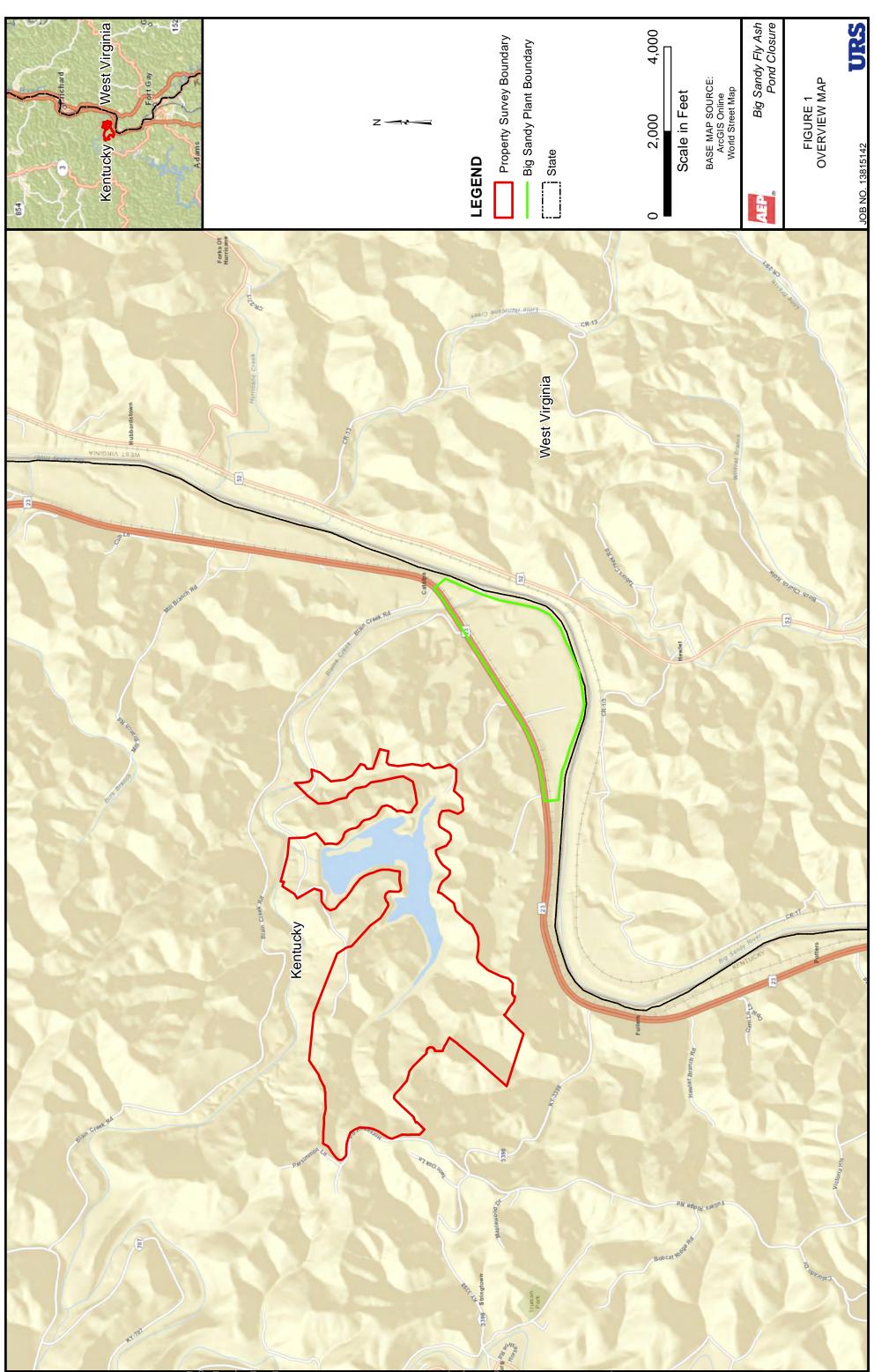
Form $Used^a$: RBA = Rapid Bioassessment Protocol, HGS = High Gradient Stream Score^b: <math>NA = Not Applicable



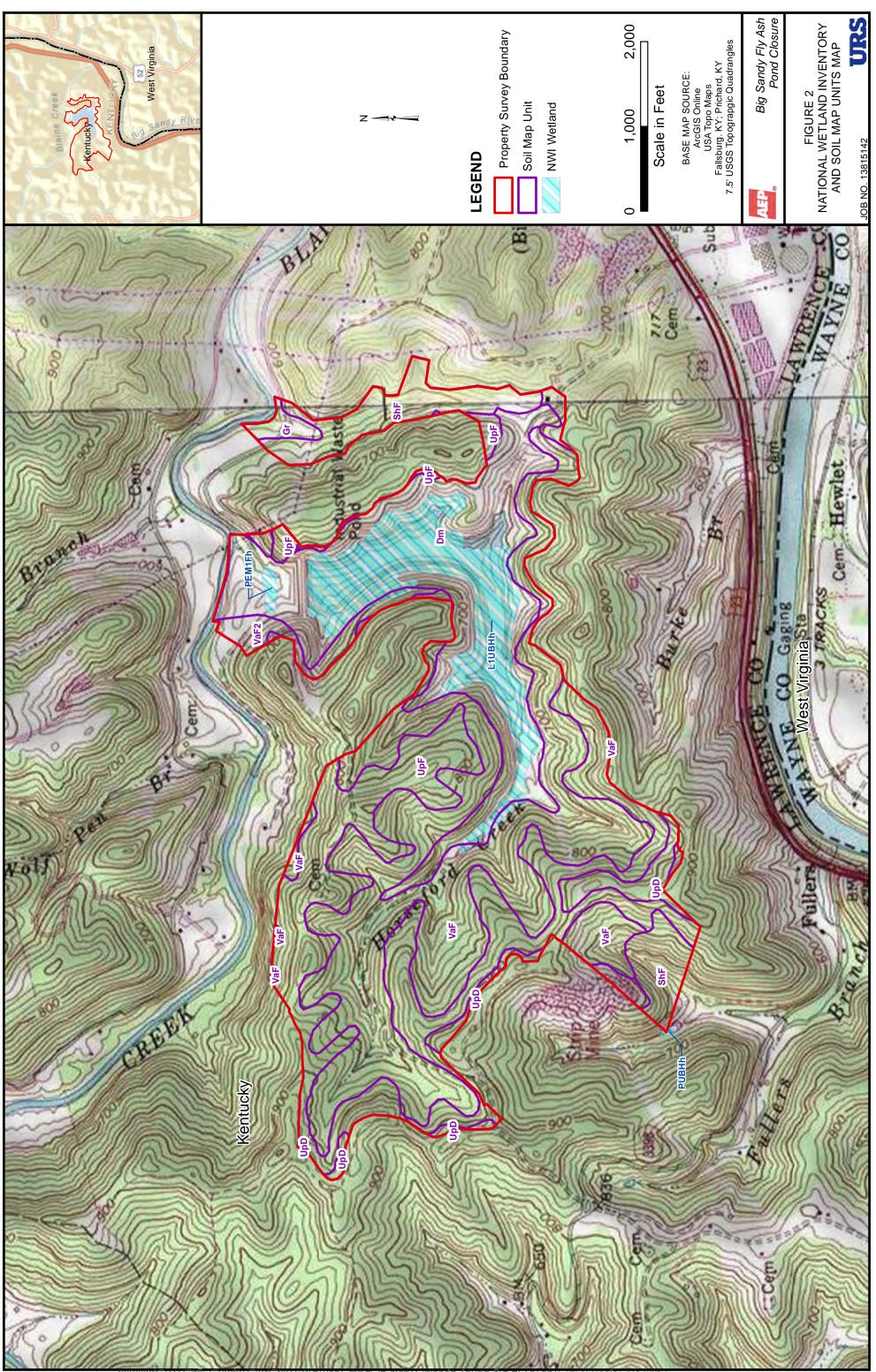
TABLE 6DELINEATED PONDS WITHIN THE BIG SANDYFLY ASH POND CLOSURE PROJECT SURVEY AREA

Report Name	Latitude	Longitude	Acreage within Survey Corridor
Pond 1	38.177116	-82.641885	0.24
Total: 1			0.24

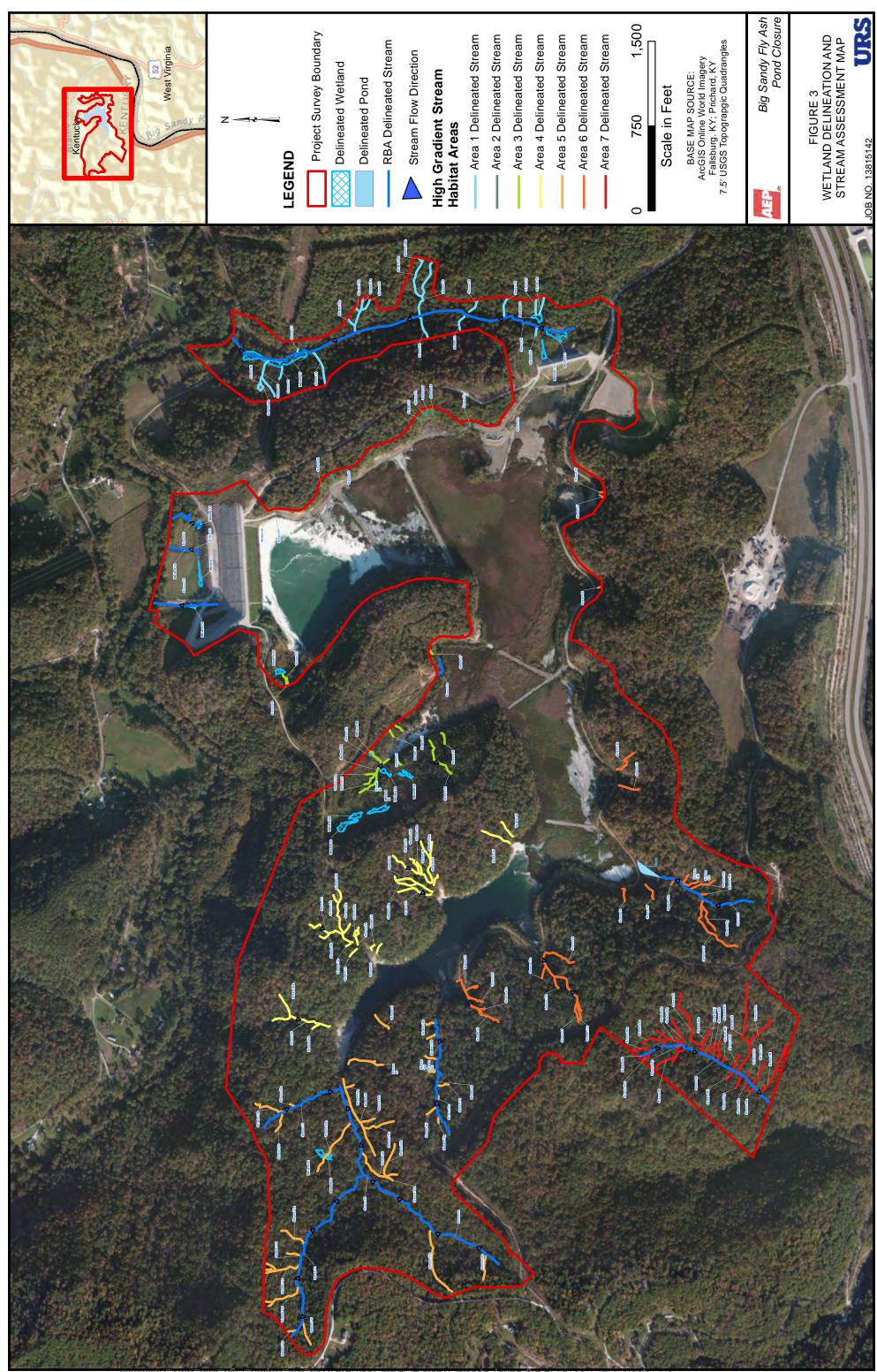




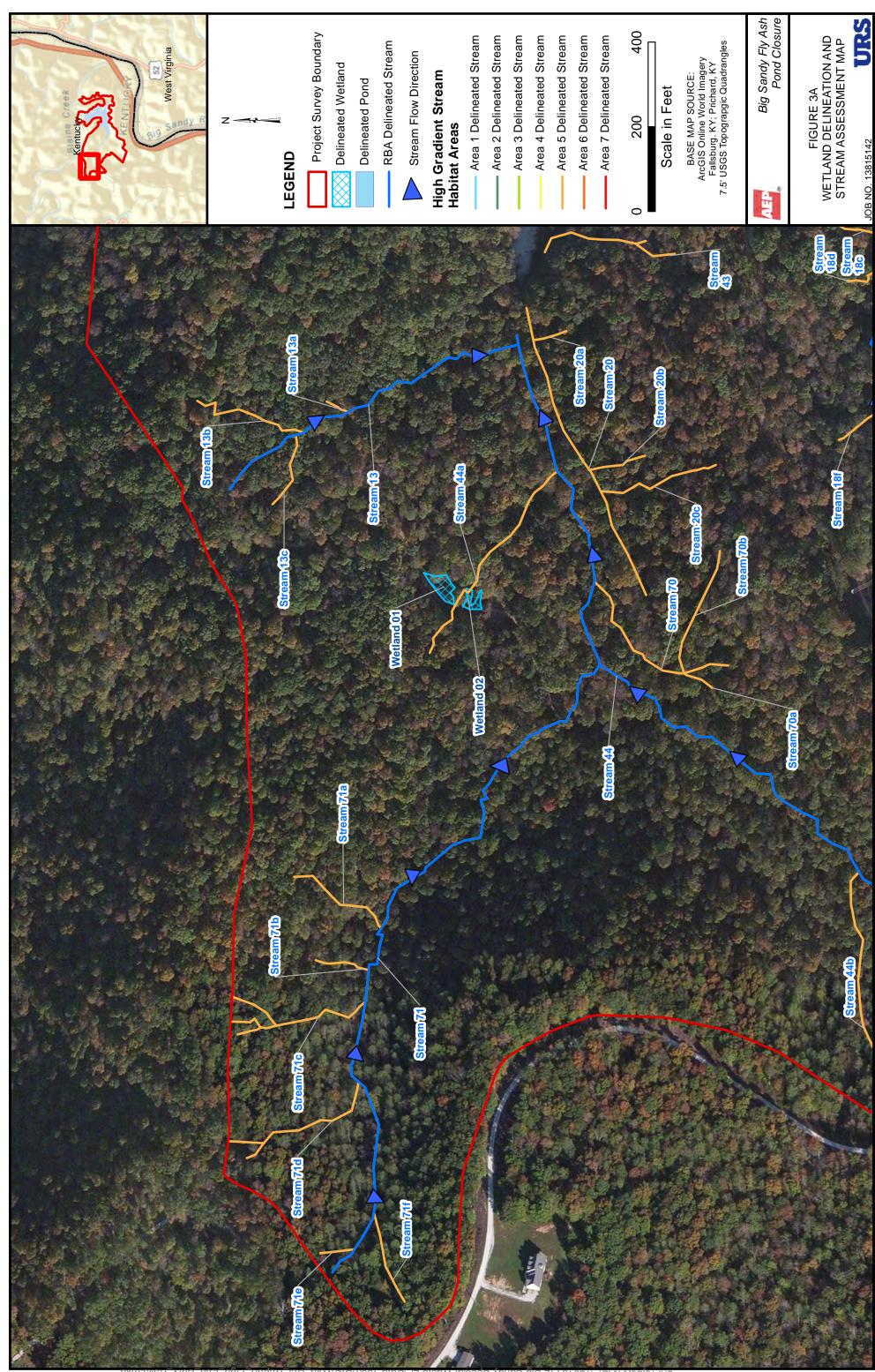
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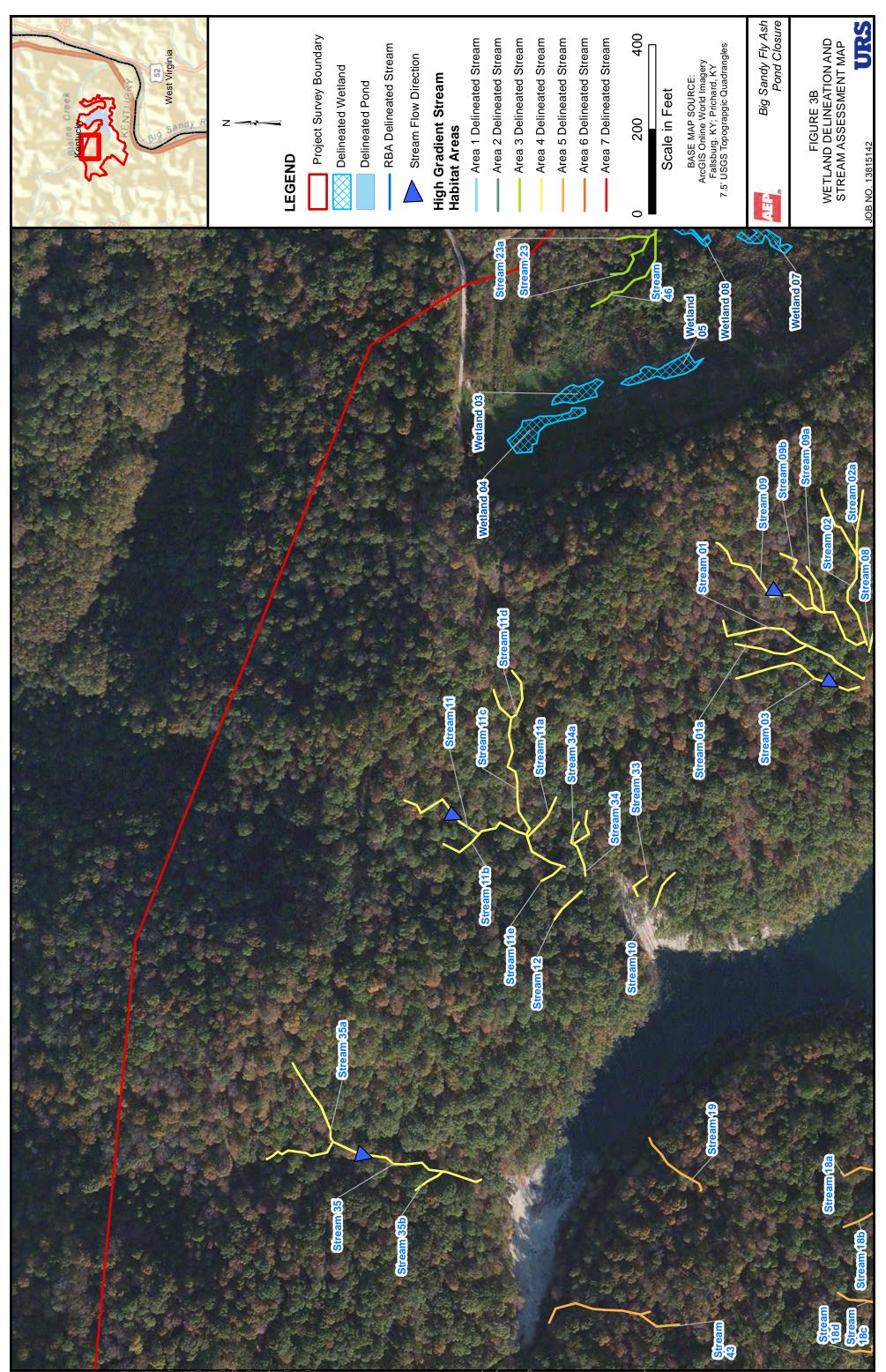
Path: J:/Proiect/A/AE/91131828 Big Sandv Special Waste LF/Data-Tech/GIS/Wtld Del Report Fioz NWI Soil.mx



J:\Project/A/AEP/13815142 Big Sandy Special Waste LF/Data-Tech/GIS/Wtld Del Report Fig3 Eco Surv Ralta.mxd



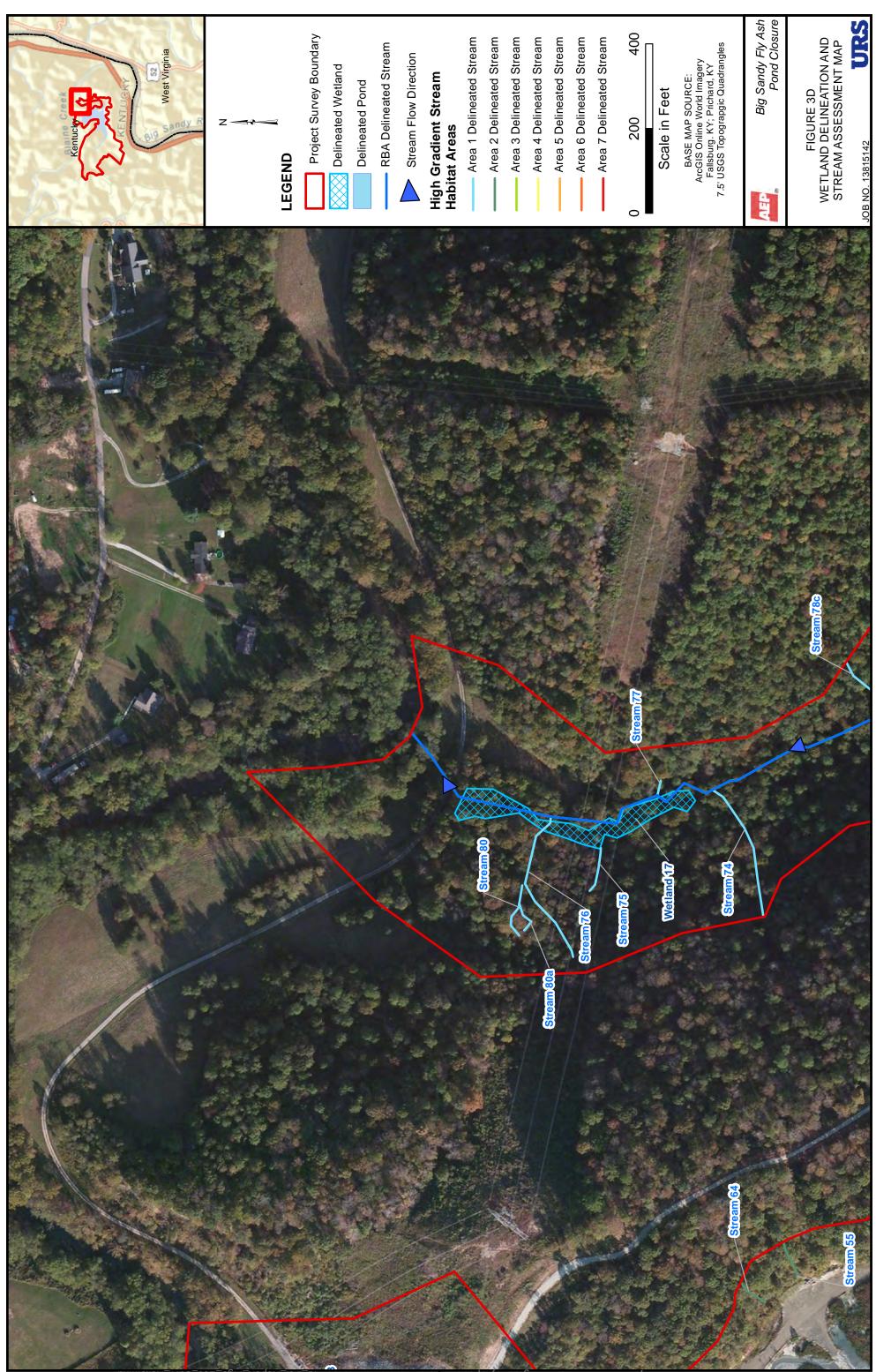
J:\Proiect/A/AEP/13815142 Bia Sandv Special Waste LF/Data-Tech/GIS/Wtld Del Report Fia3 Eco Surv Ralts.mxd



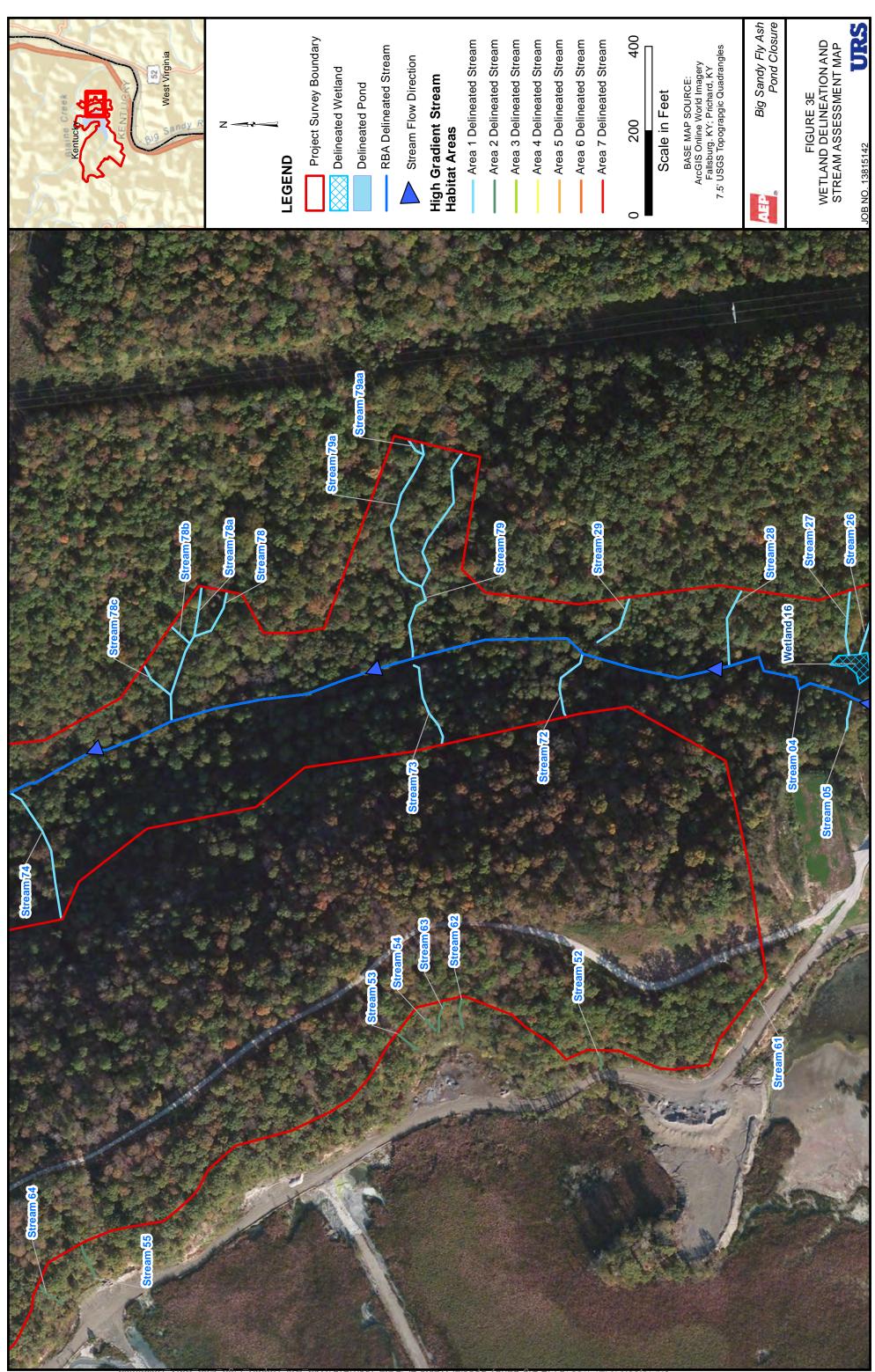
1:/Proiect/A/AEP/13815142 Bia Sandv Special Waste LE/Data-Tech/GIS/Wtld Del Report Fia3 Eco Surv Rata.mxd



1:/Project/A/AEP/13815142 Big Sandy Special Waste LF/Data-Tech/GIS/Wtld Del Report Fig3 Eco Surv Rata.mxd



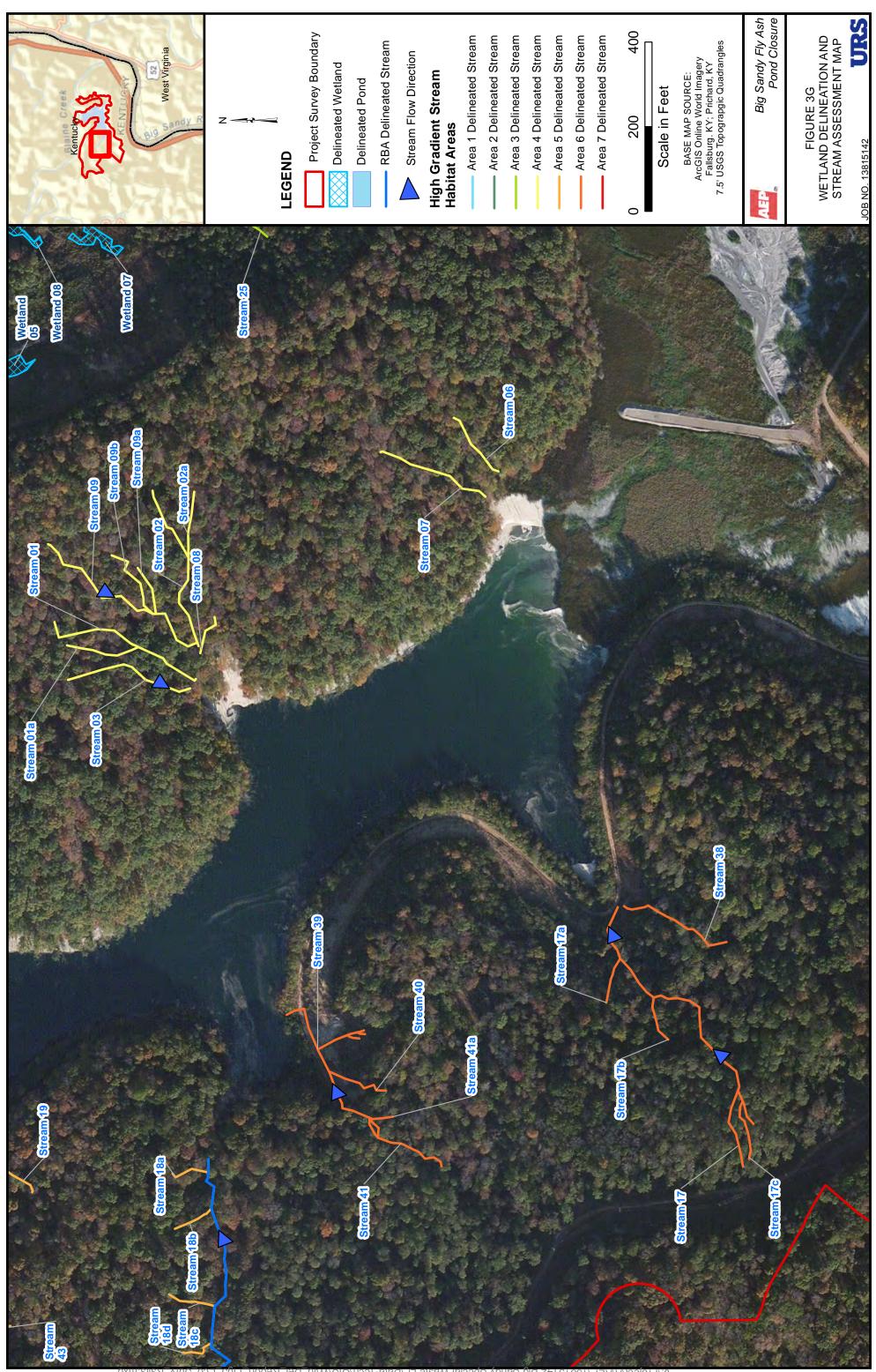
J:/Project/A/AEP/13815142 Big Sandy Special Waste LF/Data-Tech/GIS/Wtld Del Report Fig3 Eco Surv Rata wat



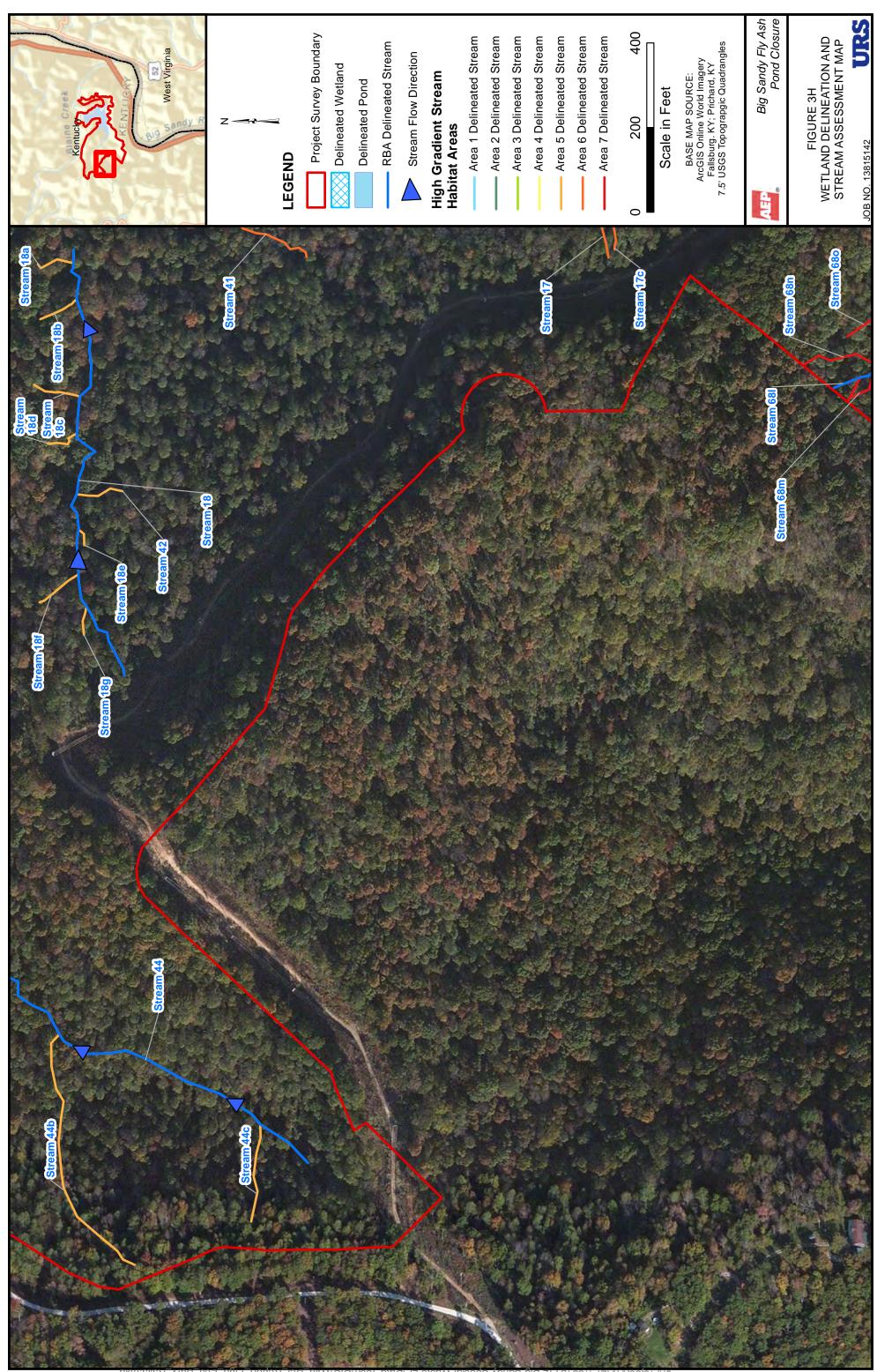
J:\Project/A/AEP/13818142 Big Sandy Special Waste LF/Data-Tech/CIS/Wtld Del Report Fig3 Eco Surv Ratta way



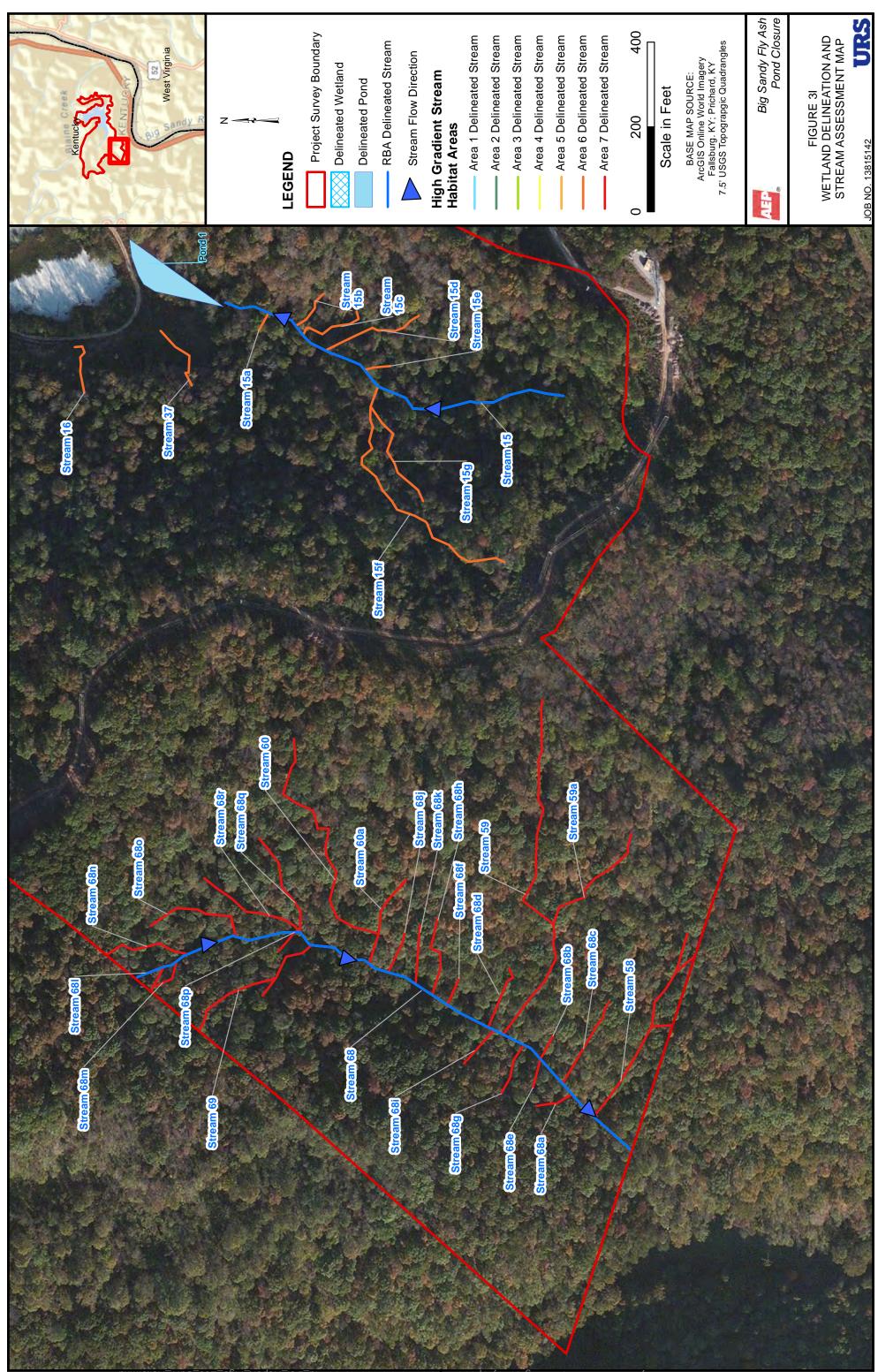
1:/Proiect/A/AEP/131818182 Bia Sandy Special Waste LF/Data-Tech/G/S/Wtld_Del_Report_Fia3_Eco_Sury_Ratia_nxa



J:\Project/AAEP/13815142 Big Sandy Special Waste LF/Data-Tech/GIS/Wtid Del Report Fig3 Eco Surv Ratis.mxd



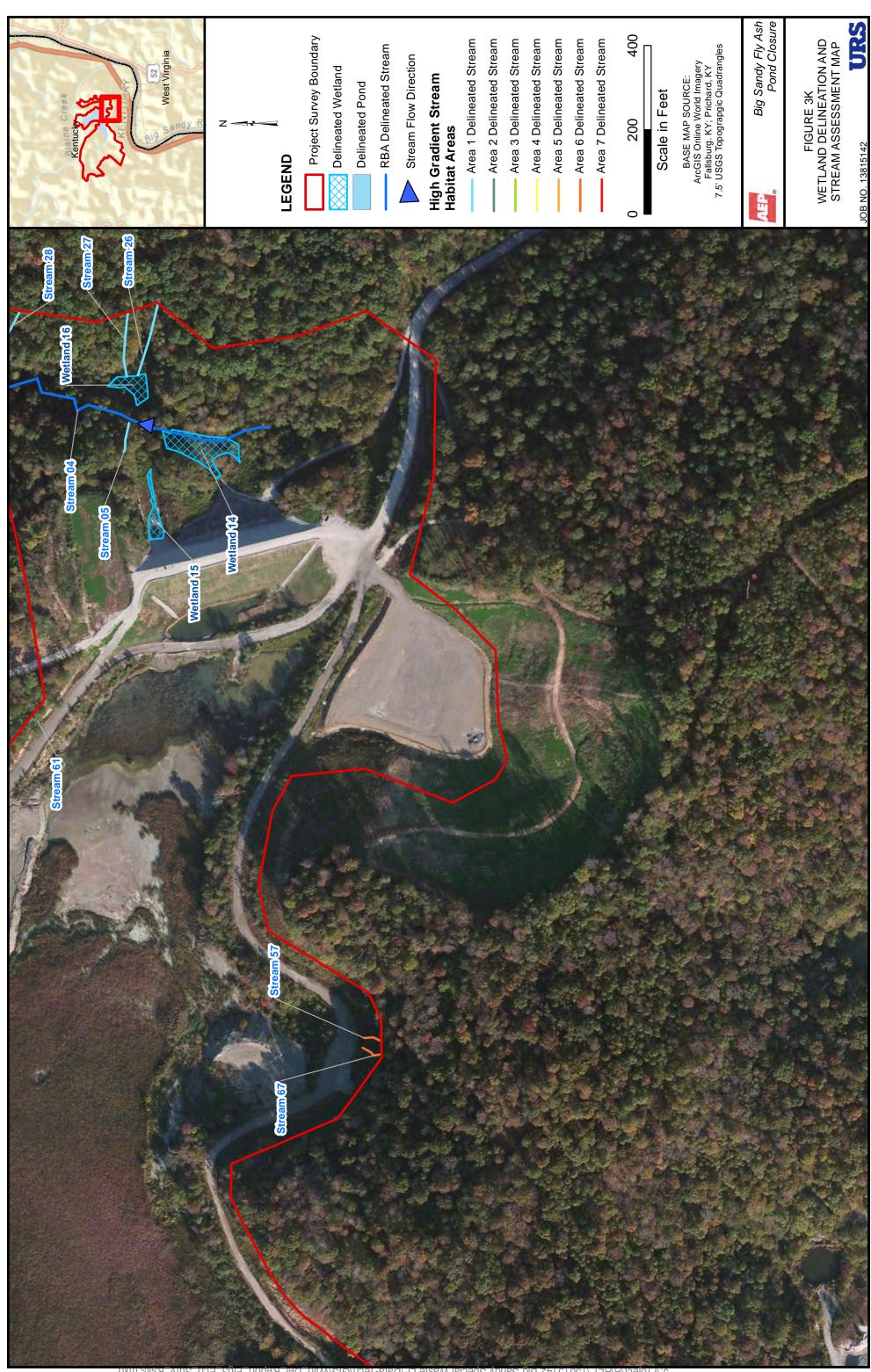
J:\Project/A/AEP/1361628162 Big Sandy Special Waste LF/Data-Tech/G/S/Wtld Del Report Fig3 Eco Sury Ralta.mxd



1:/Project/A/AEP/13815142 Big Sandy Special Waste LE/Data-Tech/GIS/Wtld Del Report Fig3 Eco Surv Rata-mxd



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APPENDIX A

U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION DATA FORMS



	TA FORM – Eastern Mountains and Piedmont
Project/Site: AFP BYSANDY POWD CLOSURE	City/County: Louisn, LAWREWLE Sampling Date: 05/23
	State:/C/ Sampling Point:/
Investigator(s): BAO, MDT	
andform (hillslope terrace etc.): De-pro-CCUMMAL	ocal relief (concave, convex, none):
Subregion (I RR or MI RA):	195/44 Long: - 82 (15642 Datum:
Soil Map Linit Name: Va F	Image:
Are climatic / hydrologic conditions on the site typical for this time of y	
	y disturbed? Are "Normal Circumstances" present? Yes <u>×</u> No_
Are Vegetation, Soil, or Hydrology naturally pr	
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, e
Hydrophytic Vegetation Present? Yes No	- Is the Sampled Area
Hydric Soil Present? Yes K No	- within a Wetland? Yes No
Wetland Hydrology Present? Yes <u>K</u> No	-
Remarks:	
PEM/DSS WETLAND LOCATED ON SI	IDE OF ACCESS ROAD, THAT APPEARS
TO HAVE BEEN A HISTORICALLY EXCAN	ATED ANEY
IYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two require
Primary Indicators (minimum of one is required; check all that apply)) Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic F	
	fide Odor (C1)
	cospheres on Living Roots (C3) Moss Trim Lines (B16) Reduced Iron (C4) Dry-Season Water Table (C2)
	Reduced Iron (C4) Dry-Season Water Table (C2) Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Sur	
Algal Mat or Crust (B4) Other (Explain	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9) Aquatic Fauna (B13)	Microtopographic Relief (D4) _ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches	is):
Water Table Present? Yes No Depth (inches	
Saturation Present? Yes No Depth (inches	
(includes capillary fringe)	tos, previous inspections), if available:
	tos, previous inspections), if available:
(includes capillary fringe)	tos, previous inspections), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot	tos, previous inspections), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot	tos, previous inspections), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot	tos, previous inspections), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot Remarks:	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot Remarks:	NEVIM S-MOTOSO312-07-5105-4/
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot Remarks:	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot Remarks:	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot Remarks:	

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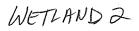
VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point:

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1. NONE		<u> </u>	. <u> </u>	That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3		<u></u>		Species Across All Strata:
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC:7576 (A/B)
7.				Prevalence Index worksheet:
· · ·		= Total Cov	(Or	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:)		10101 000		OBL species $(0) \times 1 = (0)$
1. PLANTUS Occidentalis	30	×	FACW	FACW species $dO = x^2 = 120$
2. FRAXINUS pennsylvanica				FAC species $50 \times 3 = 150$
3				FACU species $10 \times 4 = 40$
4				UPL species x 5 =
5				Column Totals: $\underline{180}$ (A) $\underline{370}$ (B)
6				· · ·
		•		Prevalence Index = B/A = 2.05^{-1}
7		= Total Cov		Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)		= Total Cov	ver	1 - Rapid Test for Hydrophytic Vegetation
1. <u>Prbus allegheniensis</u>	10	\checkmark	FACU	$\cancel{4}$ 2 - Dominance Test is >50%
2		X	. ,	$\cancel{-3}$ - Prevalence Index is $\leq 3.0^1$
2			·	4 - Morphological Adaptations ¹ (Provide supporting
3				data in Remarks or on a separate sheet)
4				Problematic Hydrophytic Vegetation ¹ (Explain)
5				
6		<u> </u>		¹ Indicators of hydric soil and wetland hydrology must
7	-	<u> </u>		be present, unless disturbed or problematic.
Herb Stratum (Plot size:)	$\underline{\mathcal{N}}$	= Total Cov	ver	Definitions of Five Vegetation Strata:
1. Dichan thelium Claudestinum	ΣD	X	Carl	Tree – Woody plants, excluding woody vines,
2. Importions capensis	- <u> </u>			approximately 20 ft (6 m) or more in height and 3 in
				(7.6 cm) or larger in diameter at breast height (DBH).
3. Sciepus atroviruns		<u>_x</u>		Sapling – Woody plants, excluding woody vines,
4. Carex Vulpinoidea		<u> </u>	OBL	approximately 20 ft (6 m) or more in height and less
5. Onoclea SensiBilis			FACW	than 3 in. (7.6 cm) DBH.
6			. <u></u>	Shrub – Woody plants, excluding woody vines,
7				approximately 3 to 20 ft (1 to 6 m) in height.
8				
9				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
10		<u> </u>		plants, except woody vines, less than approximately
11		<u> </u>		3 ft (1 m) in height.
12				Woody vine - All woody vines, regardless of height.
	130	= Total Cov	ver	
Woody Vine Stratum (Plot size:)	۵			
1				
2				
3				
4				Hydrophytic Vegetation
5.				Present? Yes No
		= Total Cov	/er	
Remarks: (Include photo numbers here or on a separate	sheet.)	<u></u>		L
	- /			

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SOIL							Sampling P	oint:
Profile Des	cription: (Describe	to the dep	th needed to docur	ment the i	indicator	or confirm	n the absence of indicators.)	
Depth	Matrix		Redo	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	%		Loc ²	Texture Rema	rks
0-4	10yrull	70	104R 5/8	-50	_ <u>C</u>	M	SILTYCLAY	
10-12	wyruli	100	<u> </u>				CUMY	
	• •						•	
<u> </u>			<u> </u>					
		·			·	<u> </u>		
<u> </u>					. <u></u> ,	·		
<u> </u>					·		•••	
				<u> </u>				
<u></u>								
$\frac{1}{1}$	oncentration, D=Dep	letion RM:	Reduced Matrix M	S=Masker	d Sand Gr	ains	² Location: PL=Pore Lining, M=Ma	atriv
Hydric Soil			-Reduced Matrix, M	0-11103/00		ams	Indicators for Problemati	
Histoso			Dark Surface	e (S7)			2 cm Muck (A10) (ML	•
	pipedon (A2)		Polyvalue Be		ice (S8) (N	ILRA 14 7		,
	istic (A3)		Thin Dark Su				(MLRA 147, 148)	
	en Sulfide (A4)		Loamy Gleye				Piedmont Floodplain S	ioils (F19)
Stratifie	d Layers (A5)		Depleted Ma	ıtrix (F3)			(MLRA 136, 147)	
2 cm Mi	uck (A10) (LRR N)		Redox Dark	Surface (F	=6)		Red Parent Material (1	,
Deplete	d Below Dark Surfac	e (A11)	Depleted Da	rk Surface	e (F7)		Very Shallow Dark Sui	
_	ark Surface (A12)		Redox Depre	•			Other (Explain in Rem	arks)
	Mucky Mineral (S1) (I	_RR N,	Iron-Mangan		es (F12) (LRR N,		
	A 147, 148)		MLRA 13					
	Gleyed Matrix (S4)		Umbric Surfa	. ,	•	. ,	³ Indicators of hydrophytic	
	Redox (S5)		Piedmont Flo	oodplain S	Soils (F19)	(MLRA 1	, , , , , , , , , , , , , , , , , , , ,	
	d Matrix (S6)						unless disturbed or pro	oblematic.
	Layer (if observed):							
Type:								\checkmark
Depth (in	iches):						Hydric Soil Present? Yes	<u>No</u>
Remarks:								



WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

Project/Site: Atp BIGSANDY POND CLOSURE City/County: 101154, 14000=WLC Sampling Date: 05/03/12
Applicant/Owner: <u>AEP</u> State: <u>k/</u> Sampling Point: <u>6</u> 2
Investigator(s):
Landform (hillslope, terrace, etc.): DEPRESSION 90 Local relief (concave, convex, none): Con CHAVE Slope (%):
Subregion (LRR or MLRA): Lat: 38. 18494 Locarteller (contrave, contrave, none).
Subregion (LRR or MLRA): Lat: Long: Long: Dotum: Datum:
Soil Map Unit Name: NWI classification:NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation \mathcal{N} , Soil \mathcal{N} , or Hydrology \mathcal{N} naturally problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes No Hydric Soil Present? Yes No within a Wetland? Yes No Wetland Hydrology Present? Yes No within a Wetland? Yes No Remarks: Yes Yes Yes Yes Yes Yes Yes
PEM WETLAND LOCATED ON SIDE OF ACCESS ROAD THAT APPENARS TO HAVE BEEN A HISTORICALLY EXCANATED AREA.
HYDROLOGY
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6)
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 <u>/</u> Depth (inches):
Water Table Present? Yes No K Depth (inches):
Saturation Present? Yes No <u>/</u> Depth (inches): Wetland Hydrology Present? Yes <u>/</u> No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:
WETTAND IS ABUTTING EXITEMAL STREAM S-MDT-052312-07 SIDE#1

WETLANDO

Sampling Point: _____

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

		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1. NONE		<u> </u>		That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata: (B)
				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:(A/B)
6				
7. <				Prevalence Index worksheet:
	:	= Total Cov	/er	Total % Cover of:Multiply by:
Sapling Stratum (Plot size:)				OBL species $50 \times 1 = 50$
and the second second				FACW species X 2 =
2				FAC species $40 \times 3 = 120$
3			~ <u> </u>	FACU species x 4 =
4				UPL species x 5 =
5.				Column Totals: 125 (A) 240 (B)
6.				
	• • • • • • • • • • • • • • • • • • • •		~~~~~~	Prevalence Index = B/A = /.92
7				Hydrophytic Vegetation Indicators:
Shruh Stratum (Plot size)	:	= Total Cov	/er	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size:				$\underline{\checkmark}$ 2 - Dominance Test is >50%
1. NONE	·		<u> </u>	
2				$\underline{}$ 3 - Prevalence Index is ≤3.0 ¹
3				4 - Morphological Adaptations ¹ (Provide supporting
4				data in Remarks or on a separate sheet)
~; spreed				Problematic Hydrophytic Vegetation ¹ (Explain)
6		<u> </u>	~- <u>-</u> -	¹ Indicators of hydric soil and wetland hydrology must
7	•	·	<u> </u>	be present, unless disturbed or problematic.
		= Total Cov	/er	Definitions of Five Vegetation Strata:
Herb Stratum (Plot size:)			r	
1. Sanpus cyperinus			FACW	Tree – Woody plants, excluding woody vines,
2. Scinpus atrovinens	20		OBL	approximately 20 ft (6 m) or more in height and 3 in.
3. Juncus effusile			FACUS	(7.6 cm) or larger in diameter at breast height (DBH).
4. Carles Vulpinolder		×	BBL	Sapling – Woody plants, excluding woody vines.
The state of the second second	- 30	$\overline{\chi}$	FAC	approximately 20 ft (6 m) or more in height and less
5. D. chanthelium clandestinum				than 3 in. (7.6 cm) DBH.
6. Jupatiums capunsis			FACW	Shrub – Woody plants, excluding woody vines,
7. Vuncus tenuis	/0		FAC	approximately 3 to 20 ft (1 to 6 m) in height.
8	_			
9				Herb – All herbaceous (non-woody) plants, including
				herbaceous vines, regardless of size, and woody
10		<u> </u>	<u> </u>	plants, except woody vines, less than approximately 3 ft (1 m) in height.
11				
12		<u> </u>		Woody vine – All woody vines, regardless of height.
	125	= Total Cov	ver	
Woody Vine Stratum (Plot size:)				
1. NONE				
2.				
3				
				Hydrophytic
4		<u> </u>		Manadattan
5			<u> </u>	Present? Yes <u>No</u>
		= Total Cov	ver	
Remarks: (Include photo numbers here or on a separate s	sheet.)			I

WETLAND 2

W-BAD-0	503	12	-0	2
Sampling Point:				

SOIL		Sampling Point:
Profile Description: (Describe to the de	oth needed to document the indicator or confirm	the absence of indicators.)
Depth <u>Matrix</u>	Redox Features	
(inches) Color (moist) %	Color (moist) % Type ¹ Loc ²	Texture Remarks
D-10 104R6/1 70	104R 5/8 30 C M	SILACLAY
10-12- 101/n/1 100		CLAY
and the total		
	=Reduced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :
Histosol (A1)	Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
Histic Epipedon (A2)	Polyvalue Below Surface (S8) (MLRA 147,	148) Coast Prairie Redox (A16)
Black Histic (A3)	Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	Piedmont Floodplain Soils (F19)
Stratified Layers (A5)	Depleted Matrix (F3)	(MLRA 136, 147)
2 cm Muck (A10) (LRR N)	Redox Dark Surface (F6)	Red Parent Material (TF2)
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)
Sandy Mucky Mineral (S1) (LRR N,	Iron-Manganese Masses (F12) (LRR N,	
MLRA 147, 148)	MLRA 136)	_
Sandy Gleyed Matrix (S4)	Umbric Surface (F13) (MLRA 136, 122)	³ Indicators of hydrophytic vegetation and
Sandy Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA 14)	
Stripped Matrix (S6)		unless disturbed or problematic.
Restrictive Layer (if observed):		
Туре:	Al Malana and	
Depth (inches):		Hydric Soil Present? Yes No
Remarks:		

WETLAND 3 WETLAND DETERMINATION D		שםד∹ ס≲סיןש- מ Intains and Piedm	
Project/Site: AEP BIG SANDI/	City/County: LAWACNCE	Sam	pling Date: 052442
Project/Site: <u>AEP BIG SANDY</u> Applicant/Owner: <u>AEP</u>		State: Ky Sa	$\frac{1}{2}$
Investigator(s): BAO, MDT	Section Township Range:		
Landform (hillslope, terrace, etc.): <u>HILSLOPE</u> SEEP			
Subregion (LRR or MLRA): Lat: Lat: Lat:			
Soil Map Unit Name:	Long	NIMI classification:	Datum
Are climatic / hydrologic conditions on the site typical for this time	of year? Yea X No	INVVI Classification.	
		,	eldfr.
Are Vegetation \underline{N} , Soil \underline{N} , or Hydrology \underline{N} significa			
Are Vegetation \underline{N} , Soil \underline{N} , or Hydrology \underline{N} naturall			
SUMMARY OF FINDINGS – Attach site map show	ving sampling point location	ons, transects, imp	portant features, etc.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No	within a Wetland?	Yes <u>×</u> N	ło
Remarks:			
PEM WETLAND SEEP LOCATEDON JUNIUS EFFUSES, FORMERLY EXCAUR HYDROLOGY	TED AREA (BORROW	* A1254)	(
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that ap	ply)	Surface Soil Crack	
	tic Plants (B14)		d Concave Surface (B8)
		K Drainage Patterns	
	Rhizospheres on Living Roots (C3)		
	of Reduced Iron (C4) n Reduction in Tilled Soils (C6)	 Dry-Season Water Crayfish Burrows (
Drift Deposits (B3) Thin Muck		Saturation Visible	
	lain in Remarks)	Stunted or Stresse	
Iron Deposits (B5)		⊻ Geomorphic Positi	on (D2)
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (
Water-Stained Leaves (B9)		Microtopographic F	
Aquatic Fauna (B13) Field Observations:		_ → FAC-Neutral Test	(D5)
Surface Water Present? Yes $\underline{\times}$ No Depth (inc	thes):		
Water Table Present? Yes No Depth (inc			
Saturation Present? Yes <u>X</u> No <u>Depth</u> (inc		lydrology Present?	res No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial p			
Describe Recorded Data (stream gauge, monitoring weil, aenar p	notos, previous inspections), ir ava	liable:	
Remarks:			
HILLSIDE SEER (N) and	6 INDUSTRIE OV		
TITLOUTO COCF WY SATURATE	IN A MONTAUNAN PI	ICTENI, JEE	PARE
HILLSIDE SEEP W/ SATURATE THEOUGH BEDROCK LAYORS			

WETERAND 3 VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-Md4 52412-

1.	= Total Cover	Number of Dominant Species \checkmark \checkmark That Are OBL, FACW, or FAC:(A)Total Number of DominantSpecies Across All Strata:Percent of Dominant SpeciesThat Are OBL, FACW, or FAC:Yerevalence Index worksheet:Total % Cover of:Multiply by:OBL speciesYerevalence Index worksheet:Total % Cover of:Multiply by:OBL speciesYerevalence <t< th=""></t<>
2	= Total Cover	That Are OBL, FACW, of FAC:(A)Total Number of Dominant Species Across All Strata: \bigcirc (B)Percent of Dominant Species That Are OBL, FACW, or FAC: \bigcirc (A)Prevalence Index worksheet: \bigcirc (S)Total % Cover of:Multiply by:OBL species \checkmark x 1 = \checkmark (A)FACW species $(\bigcirc$ x 2 = \checkmark (A)FACW species $(\bigcirc$ x 3 = \checkmark (B)FACU species \checkmark x 3 = \checkmark (C)VPL species \checkmark x 4 = \checkmark (C)VPL species \checkmark x 5 =Column Totals: $\cancel{19}$ (A) $\cancel{2944}$ (B)Prevalence Index = B/A = $\cancel{2.4}$ Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation $\cancel{1}$ - Rapid Test for Hydrophytic Vegetation $\cancel{1}$ - Prevalence Index is $\le 3.0^1$ $\cancel{4}$ - Morphological Adaptations1 (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation1 (Explain)11Indicators of hydric soil and wetland hydrology mustbe present, unless disturbed or problematic.Definitions of Five Vegetation Strata:2Tree – Woody plants, excluding woody vines,
3.	= Total Cover	Species Across All Strata: (B) Percent of Dominant Species That Are OBL, FACW, or FAC: (90) (A/1 Prevalence Index worksheet: <u>Total % Cover of:</u> Multiply by: OBL species 4 x 1 = 4 FACW species 65 x 2 = 130 FAC species 40 x 3 = 120 FAC species 40 x 3 = 120 FACU species 10 x 4 = 40 UPL species 10 x 4 = 40 UPL species 2 x 5 = Column Totals: 120 (A) 294 (B Prevalence Index = B/A = 224 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^{1}$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
4.	= Total Cover	Species Across All Strata: (B) Percent of Dominant Species That Are OBL, FACW, or FAC: (90) (A/I Prevalence Index worksheet: <u>Total % Cover of:</u> Multiply by: OBL species 4 × 1 = 4 FACW species 65 × 2 = 130 FAC species 40 × 3 = 120 FAC species 40 × 4 = 40 UPL species 10 × 4 = 40 UPL species 10 × 4 = 40 UPL species 20 × 5 = Column Totals: 129 (A) 2944 (B Prevalence Index = B/A = 2.4 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation × 2 - Dominance Test is >50% 2 - Dominance Test is >50% 2 - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
5	= Total Cover	That Are OBL, FACW, or FAC: 130 (All Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 4 x 1 = 4 FACW species 65 x 2 = 130 FAC species 40 x 3 = 120 FAC species 40 x 4 = 40 UPL species 10 x 4 = 40 UPL species 10 x 4 = 40 UPL species 12 x 5 = 294 Column Totals: 129 (A) 294 (B Prevalence Index = B/A = 2.4 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^{1}$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
6	= Total Cover	That Are OBL, FACW, or FAC: 130 (All Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 4 x 1 = 4 FACW species 65 x 2 = 130 FAC species 40 x 3 = 120 FAC species 40 x 4 = 40 UPL species 10 x 4 = 40 UPL species 10 x 4 = 40 UPL species 12 x 5 = 294 Column Totals: 129 (A) 294 (B Prevalence Index = B/A = 2.4 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^{1}$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
7. = Sapling Stratum (Plot size:) = 1.	= Total Cover	Prevalence Index worksheet:Total % Cover of:Multiply by:OBL species 4 $x 1 = 4$ FACW species 65 $x 2 = 750$ FAC species 40 $x 3 = 720$ FACU species 70 $x 3 = 720$ FACU species 70 $x 4 = 40$ UPL species 70 $x 4 = 40$ UPL species 70 $x 4 = 40$ UPL species 72 $x 5 = 100$ Column Totals: $1/9$ (A) $2-94$ Hydrophytic Vegetation Indicators: $1 - Rapid Test$ for Hydrophytic Vegetation $x 2 - Dominance Test is >50%$ $x 3 - Prevalence Index is \leq 3.0^14 - Morphological Adaptations^1 (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation 1 (Explain)^1Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Definitions of Five Vegetation Strata:2Tree – Woody plants, excluding woody vines,$
Sapling Stratum (Plot size:) 1. 2. 3. 4. 5. 6. 7. Shrub Stratum (Plot size:) 1. 2. 3. 4. 5. 6. 7. 3. 4. 5. 6. 7. 1. 2. 3. 4. 5. 6. 7. 8. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 1. 1.	= Total Cover	Total % Cover of:Multiply by:OBL species 4 $x 1 = 4$ FACW species 65 $x 2 = 130$ FAC species 40 $x 3 = 120$ FACU species 10 $x 4 = 40$ UPL species $x 5 =$ Column Totals: 119 (A) 294 Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation $x 2$ - Dominance Test is >50% $x 3$ - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation 1 (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Definitions of Five Vegetation Strata:Tree – Woody plants, excluding woody vines,
Sapling Stratum (Plot size:) 1. 2. 3. 4. 5. 6. 7. Shrub Stratum (Plot size:) 1. 2. 3. 4. 5. 6. 7. 3. 4. 5. 6. 7. 1. 2. 3. 4. 5. 6. 7. 8. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 9. 1. 1. 1.	= Total Cover	OBL species 4 $x 1 =$ 4 FACW species 65 $x 2 =$ 130 FAC species 40 $x 3 =$ 120 FACU species 10 $x 4 =$ 40 UPL species $x 5 =$ 294 Column Totals: 119 (A) 294 Prevalence Index = B/A = 2.4 Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation $x 2$ - Dominance Test is >50% $x 3$ - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Definitions of Five Vegetation Strata:2Tree – Woody plants, excluding woody vines,
1.	= Total Cover	FACW species 65 $x 2 = 130$ FAC species 40 $x 3 = 120$ FACU species 10 $x 4 = 40$ UPL species $x 5 =$ Column Totals: $1/9$ (A) 294 Prevalence Index $B/A = 234$ Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation $x 2$ - Dominance Test is >50% $x 3$ - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Definitions of Five Vegetation Strata:Tree – Woody plants, excluding woody vines,
2	= Total Cover	FAC species 40 $x 3 = \sqrt{20}$ FACU species 10 $x 4 = 40$ UPL species $x 5 =$ Column Totals: 12 (A) 294 Prevalence Index = B/A = 2.4 Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation $x 2$ - Dominance Test is >50% $x 3$ - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supportindata in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.Definitions of Five Vegetation Strata:Tree – Woody plants, excluding woody vines,
3 4 5 6 5 5 7 Shrub Stratum (Plot size:) 1 2 3 4 5 5 6 7 Herb Stratum (Plot size:) 1 7 Herb Stratum (Plot size:) 1 5 5 7 4 5 5 6 7 Herb Stratum (Plot size:) 1 1 5 5 5 5 5 7 1 1 1 1 1 2 3 5	= Total Cover	FACU species 10 x 4 = 40 UPL species x 5 =
3 4 5 6 5 5 7 Shrub Stratum (Plot size:) 1 2 3 4 5 5 6 7 Herb Stratum (Plot size:) 1 7 Herb Stratum (Plot size:) 1 5 5 7 4 5 5 6 7 Herb Stratum (Plot size:) 1 1 5 5 5 5 5 7 1 1 1 1 1 2 3 5	Total Cover	UPL species x 5 = Column Totals: //2 (A) 2.94 (B) Prevalence Index = B/A = Z.4 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation (A) X X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations1 (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation1 (Explain) 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines, Tree
5	= Total Cover	Column Totals:
5	= Total Cover	Column Totals:
$\frac{S_{1}}{2} = \frac{S_{1}}{2} = \frac{S_{1}}{2} = \frac{S_{1}}{2} = \frac{S_{1}}{2} = \frac{S_{2}}{2} = $	= Total Cover	Prevalence Index = B/A =
7 = Shrub Stratum (Plot size:) = 1 = 2 = 3 = 4 = 5 = 4 = 5 = Herb Stratum (Plot size:) = 1. $\frac{1}{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$	Total Cover	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations1 (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation1 (Explain) 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Shrub Stratum (Plot size:) = = = = = = = = = = = = = = = =	= Total Cover X Facu	 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supportindata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
Shrub Stratum (Plot size:)	= Total Cover X Facu	 ∠ 2 - Dominance Test is >50% ∠ 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supportidata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) Herb Stratum (Plot size:)	= Total Cover X Facu	 ✓ 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supportidata in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) Herb Stratum (Plot size:)	= Total Cover	 4 - Morphological Adaptations¹ (Provide supporti data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) Herb Stratum (Plot size:)	= Total Cover	 data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) Herb Stratum (Plot size:)	= Total Cover	 Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
Image: Stratum (Plot size:) Image: Aux cuts officies Image: Aux cuts officis Image:	= Total Cover	 ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: 2 Tree – Woody plants, excluding woody vines,
B.	= Total Cover	 be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) 1. JUNCUS OFFICES 2. NUNCUS FERUIS 2. NUNCUS FERUIS 3. WOOLCIRASS - SCIRPUS CUPERINUS 4. SETTERSX - WOWHIMF afternifolia	= Total Cover	 be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:) = 1. JUNCUS OFFICES 50 2. JUNCUS FEAUS 20 3. WOOLGRASS - SCIRPUS CUPERINUS 10 4. SEEDBOX - WOWHING Afternifolia 5	= Total Cover	 Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines,
1. JUNCUS DEC.BES 50 2. JUNCUS FEMERS 20 3. WOOLGRASS - SCINDUS CUPERINUS 10 4. SETTERS - LUDWIGHT Alternifolia 5		2 Tree – Woody plants, excluding woody vines,
2. NUNCUS FEARIS 20 3. WOOLGRASS-SCIEPUS CUPERINUS 10 4. SEEDBOX- LUDWIGHT afternifolia 5		
3. WOOLGRASS-SCIEPUS CUPERINUS 10 4. SEEDBOX- WOWHING afternifolia 5	X ble	
4. SEEBBOX- WOWIGHT afternifolia 5		- (7.6 cm) or larger in diameter at breast height (DRH)
1. SETTBEAR - LUDWIHING alternifolia 5	FACO	_
	FACU	- concretion to 20 ft (6 m) or more in beight and less
GOLDONROD 3pp SOLIDAHOSAD. 5.	<u> </u>	than 3 in. (7.6 cm) DBH.
5. fortail SUDILE SPP. 5.	FAC	
. JOE PLE COED - EUTROCHUM PURPULEUN 10	FAC	Shrub – Woody plants, excluding woody vines,
B. Sch. zachyrium Scoparium 10.	~	
NAAROWIEAF CATTALE TUPHA AVAVATIENT &	OBL	Herb - All herbaceous (non-woody) plants, including
O. DARK GAREN BULKUSH - 92-12/149 ATTROVIDENTS 2	BBL	 herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately
		3 ft (1 m) in height.
1		-
2		Woody vine All woody vines, regardless of height.
Voody Vine Stratum (Plot size:)	= Total Cover	
		-
		-
3		- Hydrophytic
4		- Vegetation
5		_ Present? Yes <u>No</u>
/=	= Total Cover	
Remarks: (Include photo numbers here or on a separate sheet.)		
Activities (include photo numbers here of on a separate sheet,)		

WETZAND 3 SOIL

Sampling Point: <u>20-2007524</u>12-1

Depth	ription: (Describe to t Matrix		Redox Featur			i the abse	noe of mulcators.)
(inches)	Color (moist)	% Color (moist) <u>%</u>	Type ¹	_Loc ²		e Remarks
0-8.	VSEE BELOW)+					
8-		BEDRICKL					
<u> </u>		<u> </u>	······································			•	
,						<u></u>	
			······································				·····
	<u></u>						
	Discontration, D=Depletic	n RM-Roduced Matri	v MS-Mack		aine	² Location	n: PL=Pore Lining, M=Matrix.
Type: C=CC Tydric Soil I		n, run-reduced math	A, MO-MASK	su Sanu Gi	dins.		dicators for Problematic Hydric Soils ³ :
Histosol		Dark Su	rface (S7)				_ 2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		e Below Sur	face (S8) (I	MLRA 147,		_ Coast Prairie Redox (A16)
Black Hi			rk Surface (S		147, 148)		(MLRA 147, 148)
	n Sulfide (A4)		Bleyed Matrix	: (F2)			_ Piedmont Floodplain Soils (F19)
	l Layers (A5) ick (A10) (LRR N)		d Matrix (F3) Dark Surface	(E6)			(MLRA 136, 147) _ Red Parent Material (TF2)
	Below Dark Surface (A		d Dark Surface	• •			_ Very Shallow Dark Surface (TF12)
	ark Surface (A12)		epressions (X	∠ Other (Explain in Remarks)
	lucky Mineral (S1) (LRR		nganese Mas	ses (F12)	(LRR N,		
	A 147, 148)		A 136)				3
	Bleyed Matrix (S4)		Surface (F13 nt Floodplain		-		³ Indicators of hydrophytic vegetation and
Sandy R Stripped	Matrix (S6)		пстюоцріан	3005 (F19)		+0)	wetland hydrology must be present, unless disturbed or problematic.
	_ayer (if observed):						
Type:							
Depth (inc	ches):					Hydric	Soil Present? Yes 🔀 No
Remarks:	······································						
							¥
	* DISTORBE	D Soils GI	LAVELU.	SANDY	CLAY	WIT	+ VARIOUS MOTTLING.
			,		(~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	AT S'R	EFUSIAL AT	BEDRA	sck.			
	MOTTLES -	ORANHE, WHITI	SH GREW.	BLACK			
	×.		/ (0-11 UC	1		
	~						
	THE VAR	LOUS MOT	TUNH	ÉU	nsori	100	EIRAVEZ ALLUVIUM
	APPEARS	to BE	CAUSEY	> BU	HISTO	ORIC D	DISTURBANCE
	¥		· · · ·	7			
	~						



WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont

Project/Site: <u>AEP BIG SANDY</u> City/County: <u>LOUISH</u>	LAWRENCE Sampling Date: 2012, MRY 24
	State: Sampling Point:O
Investigator(s): <u>BAO</u> , <u>MDT</u> Section, Township, Rang	
Landform (hillslope, terrace, etc.): <u>SEEP</u> Local relief (concave, conve	x, none): Slope (%):
Subregion (LRR or MLRA): Lat: Lat: Lat: Lat: Long:	
	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No	
Are Vegetation <u>N</u> , Soil <u>Y</u> , or Hydrology <u>Y</u> significantly disturbed? Are "N	¥.
	ded, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point lo	
Hydrophytic Vegetation Present? YesX No Is the Sampled A Hydric Soil Present? YesX No within a Wetland Wetland Hydrology Present? YesX No No	Area I? Yes No
Remarks:	
PEM WETLAND SEEP LOCATED ON HILLSLOPE. PREVIO	USLY EXCANATED HREA - WITH
DISTURBED SOILS. (FORMER BORROLD AREA)	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)

I minury maioditoro (minimum			
Surface Water (A1)		True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)		Hydrogen Sulfide Odor (C	1) <u>×</u> Drainage Patterns (B10)
K Saturation (A3)		Oxidized Rhizospheres on	Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1)		Presence of Reduced Iron	(C4) Dry-Season Water Table (C2)
Sediment Deposits (B2)		Recent Iron Reduction in T	illed 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)			K Geomorphic Position (D2)
Inundation Visible on Aer	ial Imagery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B	9)		Microtopographic Relief (D4)
Aquatic Fauna (B13)			K FAC-Neutral Test (D5)
Field Observations:	· · · · · · · · · · · · · · · · · · ·		
Surface Water Present?	Yes No	── Depth (inches):	
Water Table Present?	Yes 🗶 No _	Depth (inches): <u>Sur Priv</u>	UT
	Mar Market	Double Conchards Sur Craf	Wotland Hudrology Dresent2 Von V
Saturation Present?	Yes <u>x</u> INO _	Depth (Inches): <u>20101 110</u>	Wetland Hydrology Present? Yes <u>X</u> No
(includes capillary fringe)		Depth (inches): <u>Sunfac</u>	
(includes capillary fringe)		ing well, aerial photos, previous	
(includes capillary fringe) Describe Recorded Data (stre			
(includes capillary fringe)			
(includes capillary fringe) Describe Recorded Data (stre			
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor		inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:
(includes capillary fringe) Describe Recorded Data (stre Remarks:	am gauge, m onitor	ing well, aerial photos, previous	inspections), if available:

WETLANDY

SOIL							04	Sampling Point:
Profile Desc	cription: (Describe t	o the depth	needed to docu	ment the i	ndicator	or confirm	the absence of	indicators.)
Depth	Matrix		Redo	ox Features	5			,
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	* SEE BELOU	s x						
4-	REFUGAL							
						·		
						·		
	4P						<u> </u>	
			<u></u>					
<u></u>	<u></u>						••••••••••••••••••••••••••••••••••••••	
		<u> </u>				·		
	oncentration, D=Depl	etion, RM=F	Reduced Matrix, M	S=Masked	Sand Gr	ains.		Pore Lining, M=Matrix.
Hydric Soil								rs for Problematic Hydric Soils ³ :
Histosol			Dark Surface		(CO) / I			n Muck (A10) (MLRA 14 7)
	pipedon (A2) istic (A3)		Polyvalue Be					st Prairie Redox (A16) MLRA 147, 148)
	en Sulfide (A4)		Loamy Gley			147, 140)		Imont Floodplain Soils (F19)
	d Layers (A5)		Depleted Ma		,			MLRA 136, 147)
	uck (A10) (LRR N)		Redox Dark		6)			Parent Material (TF2)
· ·	d Below Dark Surface	(A11)	Depleted Da					/ Shallow Dark Surface (TF12)
	ark Surface (A12)		Redox Depre				Oth	er (Explain in Remarks)
	/lucky Mineral (S1) (L	RR N,	Iron-Mangar MLRA 13		es (F12) (LRR N,		
	A 147, 148) Gleyed Matrix (S4)		Umbric Surfa		MIRA 13	6 122)	³ Indica	tors of hydrophytic vegetation and
	Redox (S5)		Piedmont Flo					and hydrology must be present,
	Matrix (S6)			•	(***)	•		ess disturbed or problematic.
Restrictive	Layer (if observed):	·····				,		
Туре:								λ
Depth (in	ches):						Hydric Soil P	resent? Yes No
Remarks:					·		-1	
V	7.07.000	. 00	1.2 4	SAND	VCL	ny u	1174 SAM	e Annuel
+	DISTURBE	5 20	(14100	7 -			
	DEFUGAL							
	y" at p	ED ROCK						
		1120121	16 1.105	. 000	~ 110	10		Incantin Cardos
	VARIOUS	WWWWW	NEL DUIS	ODJE	RVED	ALO	Not of	UNSONTED GRAVER
		t.	_	~				
	ALLUVIC	ma	FNACTURE	o Be	DROC	K T	HAT AP	PEAR Due to
	1/15-DRK	DIST	URBANGE					
	Fruit	<u> </u>						
ļ								

L

WETCANDY

h	Juno	7	P 1.	O	56	34	12	4 999/	\bigcirc	0
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VEGETATION (Five Strata) – Use scientific names of plants.

'EGETATION (Five Strata) – Use scientific na				Sampling Point:
Tree Stratum (Plot size:)	Absolute <u>% Cover</u>		t Indicator <u>Status</u>	Dominance Test worksheet:
1		• • • • • • • • • • • • • • • • • • •		Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant Species Across All Strata:
4		++		Percent of Dominant Species
5				That Are OBL, FACW, or FAC: (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Sapling Stratum (Plot size:)				OBL species x 1 =
	<u> </u>	···		FACW species $400 \times 2 = 120$
2				FAC species $50 \times 3 = \frac{156}{200}$
3				FACU species $5 x 4 = 20$ UPL species $x 5 = 5$
5		······		Column Totals: 2 (A) 2 (B)
5				Prevalence Index = $B/A = -\frac{\partial}{\partial} \cdot \frac{\partial}{\partial}$
7				Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)		= Total Co	over	1 - Rapid Test for Hydrophytic Vegetation
1				_∠ 2 - Dominance Test is >50%
				X 3 - Prevalence Index is ≤3.0 ¹
3				4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
				Problematic Hydrophytic Vegetation ¹ (Explain)
5 6				
7				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size:)		= Total Co	over	Definitions of Five Vegetation Strata:
1. JUNCUS effesses	45	$\underline{\times}$	FACW	Tree – Woody plants, excluding woody vines,
2. Juneus tenuis	20	$\underline{}$	PAC	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
3. WOOLGRASE - SCIPPUS CYPERNUS			FACW	
4. SFFD BOX - LUDWIGHT alternifolia		<u></u>	FACW	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
5. COLDENROD - SOLIDATES SAP. 6. COLTAIL STORT - SETATIO SPD.			<u>FAC</u> FAC	than 3 in. (7.6 cm) DBH.
7. JOE DIE WEED - FUFFOCHIUM PURPUREUM			Fre	Shrub Woody plants, excluding woody vines,
8. Schipocityrium Swarwan	1		FACU	approximately 3 to 20 ft (1 to 6 m) in height.
9. MARROWLENE CATTAN - TUPHA Arhustifolia			OBL.	Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
10. DARICHREEN BULRUSH - Sciepus atrovians	à	<u> </u>	OBL	plants, except woody vines, less than approximately
11. JOHNGNUM MUSS SPP.	2	<u>. </u>	OBL	3 ft (1 m) in height.
12	101			Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size:)	101	= Total Co	over	
1				
2				
3				I hadronicka atta
4				Hydrophytic Vegetation
5				Present? Yes <u>X</u> No
		= Total Co	over	
Remarks: (Include photo numbers here or on a separate sl	ieet.)			

WETLAND5	IETLAND E	5
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W-MDT-052412-03

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont

Project/Site: APP BIG SHNDU	City/County: LAWRENCE Sampling Date: 2012, MAY 24
Applicant/Owner: <u>HEP</u>	State: Sampling Point:3
Investigator(s): BAD, MDT	_ Section, Township, Range:(
Landform (hillslope, terrace, etc.): HILSIDE SeeP, TOUGF Lo	ocal relief (concave, convex, none): <u>Stope</u> Slope (%):
Subregion (LRR or MLRA): Lat:	<u>38./8358</u> Long: <u>- 82.639677</u> Datum:
Soil Map Unit Name:UPF	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of ye	/ear? Yes No (If no, explain in Remarks.) 🧳 🤞
Are Vegetation, Soil, or Hydrology significantly	y disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation \underline{N} , Soil \underline{N} , or Hydrology \underline{N} naturally pr	roblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No	- within a Wetland? Yes X No
Remarks:	
PEM WETCAND LOCATED AT	TOG-OF-SLOPE. * P.REVIOUSLY EXCAUATED
AREA WITH DISTURBED SOUS.	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Dumant Indianters (minimum of one is required; sheak all that apply)	Current and Caril Creation (DC)

wetland Hydrology Indicators:	Secondary indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
X Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1)	K Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres on Living Roc	ots (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)	KFAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <u>×</u> No Depth (inches): <u>1,5</u>	
Water Table Present? Yes No X Depth (inches):	
Saturation Present? Yes X No Depth (inches): Surface W	hellowed the dealers Descent (O. March 1997)
	etland Hydrology Present? Yes <u>No</u>
(includes capillary fringe) (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection	
(includes capillary fringe)	
(includes capillary fringe)	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection Remarks:	s), if available:

WETCHN05

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

Sampling Point:

, , , , , , , , , , , , , , , , , , ,	Absolute	Dominant	Indicator	Dominance Test worksheet:
		Species?		
1				Number of Dominant Species (A)
1				Total Number of Dominant
				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:(OO) (A/B)
6				
7				Prevalence Index worksheet:
		= Total Cov	/er	Total % Cover of:Multiply by:
Sapling Stratum (Plot size:)		i olai ooi		OBL species $\frac{\partial H}{\partial H}$ x 1 = $\frac{\partial H}{\partial H}$
1				FACW species 20 x 2 = 40
				FAC species $\frac{76}{20}$ x 3 = $\frac{210}{20}$
				FACU species 25 x 4 = 196
4				
5				Column Totals: (A) (B)
6		<u> </u>		Prevalence Index = B/A = 2.69
7		<u> </u>		Hydrophytic Vegetation Indicators:
		= Total Cov	/er	
Shrub Stratum (Plot size:)				1 - Rapid Test for Hydrophytic Vegetation
1				2 - Dominance Test is >50%
2				X 3 - Prevalence Index is ≤3.0 ¹
3				4 - Morphological Adaptations ¹ (Provide supporting
4				data in Remarks or on a separate sheet)
5				Problematic Hydrophytic Vegetation ¹ (Explain)
6				
7		<u></u>		¹ Indicators of hydric soil and wetland hydrology must
		= Total Cov		be present, unless disturbed or problematic.
Herb Stratum (Plot size:)		- Total Cov	/er	Definitions of Five Vegetation Strata:
1. BLUESTER - Schizochijfium Scoperium	25	station of the second sec	FACU	Tree – Woody plants, excluding woody vines,
2. JUNCUS TONUIS	70	$\overline{}$	FAC	approximately 20 ft (6 m) or more in height and 3 in.
3. NARROWLEHF CATTON - TUPHA ANGUGATOLIA			OBL	(7.6 cm) or larger in diameter at breast height (DBH).
		<u> </u>		Sapling – Woody plants, excluding woody vines.
4. BROADLEAD CATTORE TYPHA Julifolia				approximately 20 ft (6 m) or more in height and less
5. WOOLFIRAGS - SCINDUS CUPERNUS				than 3 in. (7.6 cm) DBH.
6. DARY FIRENS BULRUSH - SCIPPUS atrovising	2		<u>OBL</u>	Shrub – Woody plants, excluding woody vines,
7. JUNEUS EFFICIERS	_/o		FACW	approximately 3 to 20 ft (1 to 6 m) in height.
8. SPHALANUM WOSS SP.	15		GBL	
9				Herb – All herbaceous (non-woody) plants, including
10				herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately
11				3 ft (1 m) in height.
12	n	<u> </u>		Manda All and the second
· • · · · · · · · · · · · · · · · · · ·	129	= Total Cov		Woody vine - All woody vines, regardless of height.
Woody Vine Stratum (Plot size:)			/el	
1				
2				
3				
				Hydrophytic
4				Hydrophytic Vegetation
4				Vegetation
4		<u></u>		Vegetation
4 5		<u></u>		Vegetation
4 5		<u></u>		Vegetation
4 5		<u></u>		Vegetation
4 5		<u></u>		Vegetation

SOIL			Sampling Point:
Profile Des	cription: (Describe to the de	pth needed to document the indicator or confirm	the absence of indicators.)
	Matrix	Redox Features	···· ·································
Dep t h (inches)	Color (moist) %	<u>Color (moist)</u> <u>%</u> Type ¹ Loc ²	Texture Remarks
<u></u>			<u>rexture</u> <u>Remarks</u>
<u>0-4</u>	+SEE BELOW *		
4	REFUGAL		
		······································	
¹ Type: C=C	concentration D=Depletion RI	/I=Reduced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix.
Hydric Soil			Indicators for Problematic Hydric Soils ³
-		Darts Curfage (CZ)	•
Histoso	()	Dark Surface (S7)	2 cm Muck (A10) (MLRA 147)
	pipedon (A2)	Polyvalue Below Surface (S8) (MLRA 147,	
	istic (A3)	Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
Hydroge	en Sulfide (A4)	Loamy Gleyed Matrix (F2)	Piedmont Floodplain Soils (F19)
Stratifie	d Layers (A5)	Depleted Matrix (F3)	(MLRA 136, 147)
2 cm Mi	uck (A10) (LRR N)	Redox Dark Surface (F6)	Red Parent Material (TF2)
Deplete	d Below Dark Surface (A11)	Depleted Dark Surface (F7)	Very Shallow Dark Surface (TF12)
Thick D	ark Surface (A12)	Redox Depressions (F8)	Cother (Explain in Remarks)
	Mucky Mineral (S1) (LRR N,	Iron-Manganese Masses (F12) (LRR N,	
	A 147, 148)	MLRA 136)	
	Gleyed Matrix (S4)	Umbric Surface (F13) (MLRA 136, 122)	³ Indicators of hydrophytic vegetation and
	Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA 14	
	d Matrix (S6)		unless disturbed or problematic.
Restrictive	Layer (if observed):		
Туре:	///		
Depth (in	ches): 4"		Hydric Soil Present? Yes No
Remarks:			
Remarks.			
	1/ >		
	* DISTURBED	SOILS SALAND	
	•	SOILS, SANDY CLAY WITH S	SME Conte
	Que Contract	AS AT 4" AT BEORDER.	a RAVEL
	REFUSHE W	HS MT 4 AT BRARDER	
		in onder	
	Solls ALOTA	O of VARIOUS MOTTING É	
	Vore:	VARIOUS MOTTING 9	1.1.18
		1.	UNSORIED ENAVEL
	ALLINVINIA	E FRECTURED BEDROCK	
	1100000000	(BEDROCK	THAT APPEARS DUE
	TO HISTON	RIC DISTURBANCE	
	÷ ÷		



N-BAD-052410-05

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont

Project/Site: AEP BIG SANDU City/C	County: 1001514, 1MMRow Sampling Date: 05/04/2012
Applicant/Owner: AEP	County: <u>1001514</u> , <u>1000000000000000000000000000000000000</u>
Investigator(s): <u>B.0170</u> M. Thomayarz, UKS Section	,
	ief (concave, convex, none): CONCAVE Slope (%):
	5 Long: 82.6370610 Datum: Whs 84
<u>~</u>	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Y	
	rbed? Are "Normal Circumstances" present? Yes No _X
Are Vegetation $\underline{\mathcal{N}}$, Soil $\underline{\mathcal{N}}$, or Hydrology $\underline{\mathcal{N}}$ naturally problems	atic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing san	i i
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No Demontor Yes No	Is the Sampled Area within a Wetland? Yes No
Remarks: PEM/PSS WETLAND THAT IS LOCATED STREAM S-MOTS/24/12-06 (EPHEMERAL). SOILS	
HYDROLOGY	
Water Marks (B1) Presence of Reduced Sediment Deposits (B2) Recent Iron Reduction Drift Deposits (B3) Thin Muck Surface (0 Algal Mat or Crust (B4) Other (Explain in Reduction Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Yes X No Depth (inches):	lor (C1) ✓ Drainage Patterns (B10) res on Living Roots (C3) Moss Trim Lines (B16) d Iron (C4) Dry-Season Water Table (C2) on in Tilled Soils (C6) Crayfish Burrows (C8) C7) Saturation Visible on Aerial Imagery (C9) marks) Stunted or Stressed Plants (D1) ✓ Geomorphic Position (D2) Shallow Aquitard (D3)
Water Table Present? Yes No Depth (inches): Saturation Present? Yes _X No Depth (inches):	
Saturation Present? Yes X No Depth (inches): Yes X No Depth (inches):	evious inspections), if available:
15 ABUTTING EPHEMERIAL STREAM	η

WETCANDG

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

*い-131-0-053*412-05 Sampling Point: _____

	Absolute			Dominance Test worksheet:
Tree Stratum (Plot size:)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
		<u> </u>		Total Number of Dominant
3				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:(A/B)
6				Prevalence Index worksheet:
7.				Total % Cover of:Multiply by:
Conting Chatter (Distriger		≃ Total Co	/er	$\frac{1}{10000000000000000000000000000000000$
Sapling Stratum (Plot size:) 1. Saux NIAnn	20	X	OBL	FACW species $60 \times 2 = 720$
				FAC species 40 x 3 = 120
2. PLANTUS OCIDENTALIS			FACED	
3				FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: (A) (B)
6				Prevalence Index = B/A = 2.03
7				Hydrophytic Vegetation Indicators:
<u>Shrub Stratum</u> (Plot size:)	_25_	= Total Co	/er	1 - Rapid Test for Hydrophytic Vegetation
				2 - Dominance Test is >50%
1				3 - Prevalence Index is $\leq 3.0^{1}$
2				4 - Morphological Adaptations ¹ (Provide supporting
3				data in Remarks or on a separate sheet)
4				Problematic Hydrophytic Vegetation ¹ (Explain)
5	·····			
6				¹ Indicators of hydric soil and wetland hydrology must
7				be present, unless disturbed or problematic.
Herb Stratum (Plot size:)	<u> </u>	= Total Co	ver	Definitions of Five Vegetation Strata:
1. VUNUS EFUSUS	15		FACW	Tree – Woody plants, excluding woody vines,
2. SOLIDAGO SPP.				approximately 20 ft (6 m) or more in height and 3 in
			OBL	(7.6 cm) or larger in diameter at breast height (DBH).
3. Typha datifola			FACW	Sapling – Woody plants, excluding woody vines,
4. <u>Scippus cyperinus</u> 5. Scippus atrovirens	35		FACW	approximately 20 ft (6 m) or more in height and less
6. JUNIUS +CNIUS	30	- <u>×</u>		than 3 in. (7.6 cm) DBH.
	1977 S. 1		FAC	Shrub – Woody plants, excluding woody vines,
7				approximately 3 to 20 ft (1 to 6 m) in height.
8				Herb – All herbaceous (non-woody) plants, including
9				herbaceous vines, regardless of size, and woody
10				plants, except woody vines, less than approximately 3 ft (1 m) in height.
11				
12	s a beller i			Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size:)	110	= Total Co	/er	
1				
2				
3				Hydrophytic
4				Vegetation
5				Present? Yes <u>No</u>
		= Total Co	/er	
Remarks: (Include photo numbers here or on a separate	sheet.)			
1				

WETCHND (e SOIL

Sampling Point: _

Profile Des	cription: (Describe	to the depth	needed to docur	nent the i	ndicator	or confirm	the absend	ce of indicators.)
Depth	Matrix			x Features				_
(inches)	Color (moist)	%	Color (moist)	%	_Type'	Loc ²	<u> Texture</u>	Remarks
0-8			+-SEE	BEL	ow			
		<u> </u>						

	······································		- <u></u>					
					<u> </u>	<u> </u>	2	
the second se	Concentration, D=Depl	etion, RM=Re	educed Matrix, M	S=Maskec	Sand Gra	ains.		PL=Pore Lining, M=Matrix. cators for Problematic Hydric Soils ³ :
-	Indicators:		Dark Surface	(97)				-
Histoso	pipedon (A2)		Polyvalue Be	. ,	ce (S8) (N	ILRA 147.		2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16)
	listic (A3)		Thin Dark Su				,	(MLRA 147, 148)
Hydrog	en Sulfide (A4)		Loamy Gleye		F2)			Piedmont Floodplain Soils (F19)
	d Layers (A5)		Depleted Ma					(MLRA 136, 147)
	uck (A10) (LRR N) ed Below Dark Surface		Redox Dark Depleted Da	•	-			Red Parent Material (TF2) Very Shallow Dark Surface (TF12)
	ark Surface (A12)		Redox Depre				~	Other (Explain in Remarks)
	Mucky Mineral (S1) (L	.RR N,	Jron-Mangan	•		LRR N,	\succ	
	A 147, 148)		MLRA 13	•			з.	
1	Gleyed Matrix (S4)		Umbric Surfa Piedmont Flo					ndicators of hydrophytic vegetation and wetland hydrology must be present,
	Redox (S5) d Matrix (S6)			Jouhiaitt 9	015 (F19)	(WILKA 14)	0)	unless disturbed or problematic.
	Layer (if observed):				·····		1	
Туре:								
Depth (ir	nches):						Hydric So	oil Present? Yes <u>×</u> No
Remarks:								
	HYDRIC 9	DOILS	ASSUME	Ð				
	• 1							
¥	PISTONISED	> Soi	LS - Ga	CAVELY	, SA	INDY S	Suryci	My WITH VARIOUS
				(,	•	1
	MOTTLING	Coho	RS					
		•						
				,				
	THE VARI	OUS N	OTTLING	2 UI	usori	ED F	TR AVEZ	ALLUVIUM WITH
	1.1							
	Chating	in D. W.G	rock 1	APPE	ARS	DUE	7-0	HISTORIC IMPACT
	FRACIUM	-0 100-						
L								

WETCAND 7

W. MDT-052412-de

WETLAND DETERMINATION DATA FORM -	– Eastern Mountains and Piedmont Region
Project/Site: AFP BIG SANDY City/C	county: 101154, 1400 Conce Sampling Date: 24, MAY 20/2
Applicant/Owner: AEP	State: _/// Sampling Point:
Investigator(s): B. OTTO, M. THOMAYER Section	on, Township, Range:
Landform (hillslope, terrace, etc.):	ef (concave, convex, none):
Subregion (LRR or MLRA):	Long: -82.638806 Datum:
Soil Map Unit Name: UPF	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Y	
Are Vegetation, Soil, or Hydrology significantly distur	
Are Vegetation $\underline{\mathcal{A}}$, Soil $\underline{\mathcal{A}}$, or Hydrology $\underline{\mathcal{A}}$ naturally problema	
SUMMARY OF FINDINGS – Attach site map showing sam	
Sommart of Findings – Attach site map showing sam	iping point locations, transects, important reatures, etc.
Hydrophytic Vegetation Present? Yes _ ∠ No Hydric Soil Present? Yes _ ∠ No Wetland Hydrology Present? Yes _ ∠ No Remarks: K K	Is the Sampled Area within a Wetland? Yes <u>\checkmark</u> No
PEM WETZAND WITH MINIMUM POS LOCATE AREA THAT IS NOW A HILLBIDE SE	EJON HIUSIDE FORMER BORROW ANCH
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (High Water Table (A2) Hydrogen Sulfide Odd	
	es on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced	
Sediment Deposits (B2) Recent Iron Reductio	
Drift Deposits (B3) Thin Muck Surface (C	
Algal Mat or Crust (B4) Other (Explain in Ren	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	Shallow Aquitard (D3) Microtopographic Relief (D4)
Aquatic Fauna (B13)	<u></u> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches):	
Water Table Present? Yes No Depth (inches):	
Saturation Present? Yes <u>X</u> No Depth (inches): Sur	CACE Wetland Hydrology Present? Yes X No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	vious inspections), if available:
Remarks:	
121-12	
ANTA IS A FORMER BORROW; IT HAS	Broad Willing Distriction and
	Con FILMELY FISTORED WITCH
HAS CAUSED GIROUND WATER TO SEZ	
	P OUI DEDROGE

WETCHND 7

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W. MDT-052412-66

· · · · · · · · · · · · · · · · · · ·	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1.	and the second	and the second		That Are OBL, FACW, or FAC:(A)
2				
				Total Number of Dominant
3				Species Across All Strata: (B)
4				Percent of Dominant Species
5		·		That Are OBL, FACW, or FAC: (A/B)
6				Description in the first second secon
7				Prevalence index worksheet:
8				Total % Cover of: Multiply by:
		= Total Cov	er	OBL species 20 x 1 = 20
Sapling/Shrub Stratum (Plot size:)				FACW species x 2 = / { 4
1. SALIX NIHARA	5	X	FACW	FAC species 20 x 3 = $(e0)$
2. PLANTUS OCCIDENTALIS	5	~	FACW	FACU species $2 \times 4 = \%$
3				UPL species x 5 =
				17.1 7-67
4				Column Totals: <u>134</u> (A) <u>277</u> (B)
5				Prevalence Index = B/A = 2.03
6				Hydrophytic Vegetation Indicators:
7				
8				1 - Rapid Test for Hydrophytic Vegetation
9				∠ 2 - Dominance Test is >50%
10				<u>∽</u> 3 - Prevalence Index is ≤3.0 ¹
10				4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size:)	$-p_{\Sigma}$	= Total Cov	er	data in Remarks or on a separate sheet)
1. JUNCUS EFFUSUS	()	\checkmark	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. SCIRPUS CLIPERINUS				
3. Saidabo Sp.			FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. ONOCLEA GENSIBILIS	2		FACW	
5. Carex VULPINDIDE74	10		OBL	Definitions of Four Vegetation Strata:
6. SCIRPUS ATROVIRENS	_5		OBL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7. TUPHA LATIFOLIA			OBL	more in diameter at breast height (DBH), regardless of
8. FUPATORIUM PURPUREUM				height.
9. RUBUS AMERIENIENSIS			FACU	Sapling/Shrub – Woody plants, excluding vines, less
			1.00	than 3 in. DBH and greater than or equal to 3.28 ft (1
10			<u> </u>	m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
12				of size, and woody plants less than 3.28 ft tall.
	124	= Total Cov	er	
Woody Vine Stratum (Plot size:)				Woody vine - All woody vines greater than 3.28 ft in
1	and the second se			height.
2			••••	
3.				
4			•••	
5				Hydrophytic
<u>,</u>			•••	Vegetation
0	<u> </u>			Present? Yes <u> </u>
		= Total Cov	er	
Remarks: (Include photo numbers here or on a separate s	heet.)			

WETCAND 7

Sampling Point: W-MDT - 052412 - 06

SOIL				Sampling Point: W-MDT-05				
Profile Desc	Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth	Matrix Color (moist) %	<u> </u>	pe ¹ Loc ² Tex	ture Remarks				
<u>(inches)</u>	<u> </u>		<u>Silty</u>	A set Cr				
		₩ <u></u>						
			ÖF					
			GAA	WR				
		AAUUUAAUUUAUU						
			······································					
			······································					
¹ Type: C=C	oncentration, D=Depletion, RM=	Reduced Matrix, MS=Masked San	d Grains. ² Locat	tion: PL=Pore Lining, M=Matrix.				
Hydric Soil			-	Indicators for Problematic Hydric Soils ³ :				
Histosol	l (A1) pipedon (A2)	Dark Surface (S7) Polyvalue Below Surface (S	0) (NI DA 447 440)	2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16)				
	listic (A3)	Thin Dark Surface (S9) (ML		(MLRA 147, 148)				
	en Sulfide (A4)	Loamy Gleyed Matrix (F2)		Piedmont Floodplain Soils (F19)				
	d Layers (A5) uck (A10) (LRR N)	Depleted Matrix (F3) Redox Dark Surface (F6)		(MLRA 136, 147) Very Shallow Dark Surface (TF12)				
	d Below Dark Surface (A11)	Depleted Dark Surface (F7)		Other (Explain in Remarks)				
	ark Surface (A12)	Redox Depressions (F8)		\wedge				
	Mucky Mineral (S1) (LRR N, A 147, 148)	Iron-Manganese Masses (F MLRA 136)	12) (LRR N,					
1	Gleyed Matrix (S4)	Umbric Surface (F13) (MLR	A 136, 122)	³ Indicators of hydrophytic vegetation and				
	Redox (S5)	Piedmont Floodplain Soils (I		wetland hydrology must be present,				
	d Matrix (S6) Layer (if observed):	Red Parent Material (F21) (I	MLRA 127, 147)	unless disturbed or problematic.				
	FDROCK							
Depth (in	iches):		Hyd	ric Soil Present? Yes \underline{X} No				
Remarks:								
K	SOILS WE	ME DISTORB	ED WIT	H VARIOUS				
	MINTING G	COLORS 11	0					
	morries a	COLORS, LA	CHE AMOI	UNT OF GRAVEZ				
	WIN SOI	S & BEDROC	"M REA	ISAL ATC &"				
	l		The second s	· · · · · · ·				
		ţ						
	MARIDUS MAR	ATTIC & UN	SORTED	GRAVEL WITH				
	V110000 1000	MILED (
	(nonico a	EDROCK Apper	28 DUE	TO HISTORIC				
	FICACIONED IS	ennour Apper	710					
		-						
	DISTURBACE							



W-MOT-052412-07

WETLAND DETERMINATION DATA FORM – Eastern	Mountains and Piedmont Region
Project/Site: AEP 13th SANDY City/County: 100	118A, LAWRENCE Sampling Date: 24, MAY 2012
Applicant/Owner:	State: <u>///</u> Sampling Point: 7
Applicant/Owner: At P Investigator(s): BOTTO, M.T.Hommy Har. Section, Township	, Range:
Landform (hillslope, terrace, etc.): <u>HIUShopE, SEEP</u> Local relief (concave,	convex, none): 3Lofe Slope (%): 20
Landform (hillslope, terrace, etc.): <u>HIUShoft, Step</u> Local relief (concave, Subregion (LRR or MLRA): Lat: <u>35.18342</u>	Long: 82, 638703 Datum:
	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes N	
Are Vegetation $\mathcal{M}_{,}$, Soil $\mathcal{M}_{,}$, or Hydrology $\mathcal{M}_{,}$ significantly disturbed?	<u> </u>
Are Vegetation \mathcal{N} , Soil \mathcal{N} , or Hydrology \mathcal{N} naturally problematic?	If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling poi	
Hydrophytic Vegetation Present? Yes <u>X</u> No Hydric Soil Present? Yes <u>X</u> No Wetland Hydrology Present? Yes <u>X</u> No Remarks: PEM WETLAND LOCATED ON HILLSIDE, ⁴ Former HUISIDE SEEP. 4	etland? Yes <u> </u>
HYDROLOGY	
Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	
Remarks: ANEA IS A FORMER BORROW AREA; IT WHICH HAS CAUSED GROUNDWATER TO	HAS BEEN HIGHLY DISTURBED SEOP OUT OF BEDROCK.

WETCAND 8

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

Sampling Point: W-MOT 0524 12-07-

	Absoluto	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				
3				Total Number of Dominant Species Across All Strata:
5				Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
6	No. of Concession, Name	•		$\frac{1}{1} \frac{1}{2} \frac{1}$
7		. <u></u>		Prevalence Index worksheet:
				Total % Cover of: Multiply by:
8		= Total Cov		OBL species <u>10</u> x 1 = 10
Sapling/Shrub Stratum (Plot size:)		- 101ai 000	ei	FACW species x 2 = //04
1				FAC species $17 \times 3 = 51$
2				FACU species x 4 =
3	-	·	<u> </u>	UPL species x 5 =
4		·		Column Totals: 1,09 (A) 225 (B)
5.				
		·		Prevalence Index = $B/A = -2.0$
6				Hydrophytic Vegetation Indicators:
7	-	·		1 - Rapid Test for Hydrophytic Vegetation
8		•		⊻ 2 - Dominance Test is >50%
9	-	. <u></u>	,	\times 3 - Prevalence Index is $\leq 3.0^1$
10		•		4 - Morphological Adaptations ¹ (Provide supporting
		= Total Cov	er	data in Remarks or on a separate sheet)
Herb Stratum (Plot size:)	1100	V	Cores	Problematic Hydrophytic Vegetation ¹ (Explain)
1. Junas EFFUSUS	- 40	· <u> </u>	(ACW	
2. SCIRPUS ATROVIRENS		<u> X </u>	FACW	
3. CANEX NULPINOIDEA		•	<u>OBL</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. JUNCUS TERVIS			FAC	Definitions of Four Vegetation Strata:
5. SOLIDAGIO Sp.	10		FAC	bennitons of i our vegetation offata.
6. EUPATORIUM PURPUREUM			PAC	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7. LUDWIGHA ALTERNIFOLIA	2-	·	FACW	more in diameter at breast height (DBH), regardless of height.
8. Symphyptrichum puriceum	5	• •	FACW	
9				Sapling/Shrub – Woody plants, excluding vines, less
10		<u> </u>		than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
11				
12.	_			Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
	109	= Total Cov	er	or size, and woody plants less than 5.20 it tall.
Woody Vine Stratum (Plot size:)				Woody vine - All woody vines greater than 3.28 ft in
1		* *		height.
2	<u> </u>			
3				
4.				
5.				Hydrophytic
6.		•	•***	Vegetation Present? Yes K No
°		 = Total Cov	or	
		10101 001		
Remarks: (Include photo numbers here or on a separate	sheet.)			

WETLAND &

Sampling Point: W-MDT-052412-07

nches) Color (moist) % Type ¹ Loc ² Texture Remarks Image: Sect Betwork Image: Sect Betwo			oth needed to document the indicator or co	onfirm the abs	ence of indicators.)
Image: Step Bezew K ype: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 'location: PL=Pore Lining, M=Matrix. yrin: Soil Indicators: 'Indicators:)epth		<u>Redox Features</u>		re Remarks
Wate Soil Indicators: Indicators: Indicators: Indicators for Problematic Hydric Soils Histic Epipedon (A2) Dark Surface (S7) 2 cm Muck (A10) (MLRA 147, 148) Biack Histic (A3) Thin Dark Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Peledmont Floodplain Soils (F19) 2 cm Muck (A10) (LRR N) Redox Dark Surface (F6) Pelemont Floodplain Soils (F19) 2 cm Muck (A10) (LRR N) Redox Dark Surface (F7) Will RA 147, 148) 2 Sandy Mucky Mineral (S1) (LRR N, Redox Depressions (F8) Will RA 136, 127) 2 Sandy Gleyed Matrix (S4) Umbric Surface (F12) (MLRA 136, 122) Piedmont Floodplain Soils (F19) (MLRA 148) 2 Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) Piedmont Floodplain Soils (F19) (MLRA 148) 2 Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Indicators of hydrophytic vegetation an wetland hydrology must be present, unless disturbed or problematic. Type: BED Nock Hed Parent Material (F21) (MLRA 127, 147) Indicators of hydrophytic vegetation an wetland hydrology must be present, unless disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) (MLRA 136, 122) Indicators of hydrophytic vegetation an wetland hydrology must be present, unless disturbed or p	<u>k</u>				
Indicators:					
dric Soil Indicators: Histosol (A1) Bark Surface (S7) Polyvalue Below Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17) Depleted Matrix (F2) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) (LRR N, Sandy Gleyed Matrix (S4) Umbric Surface (F12) (LRR N, MLRA 136, 122) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148, 128, 127, 147) unless disturbed or problematic. striped Matrix (S4) Umbric Surface (F12) (MLRA 127, 147) Striped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Deplet (inches): 4-6 Type: BED ROUL <ld>Depth (inches): 4-6 MD BET ROUK MD</ld>					
dric Soil Indicators: Histosol (A1) Bark Surface (S7) Polyvalue Below Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17) Depleted Matrix (F2) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) (LRR N, Sandy Gleyed Matrix (S4) Umbric Surface (F12) (LRR N, MLRA 136, 122) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148, 128, 127, 147) unless disturbed or problematic. striped Matrix (S4) Umbric Surface (F12) (MLRA 127, 147) Striped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Deplet (inches): 4-6 Type: BED ROUL <ld>Depth (inches): 4-6 MD BET ROUK MD</ld>					
dric Soil Indicators: Indicators: Indicators for Problematic Hydric Soils Histosol (A1) Dark Surface (S7) 2 cm Muck (A10) (MLRA 147, 148) Histosol (A2) Polyvalue Below Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148) Coast Prairie Redox (A16) Stratified Layers (A5) Depleted Matrix (F2) Piedmont Floodplain Soils (F19) Z cm Muck (A10) (LRR N) Redox Dark Surface (F7) WIRA 147, 148) Sandy Muck (Mineral (S1) (LRR N, Klore-Manganese Masses (F12) (LRR N, Very Shallow Dark Surface (TF12) Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) andicators of hydrophytic vegetation an wetland hydrology must be present, unless disturbed or problematic. Stripped Matrix (S6) Piedmont Floodplain Soils (F19) (MLRA 127, 147) unless disturbed or problematic. Stripped Matrix (S6) Piedmont Floodplain Soils (F19) (MLRA 148) andicators of hydrophytic vegetation an wetland hydrology must be present, unless disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic. Matrix (S6) Piedmont Floodplain Soils (F19) (MLR					
dric Soil Indicators: Histosol (A1) Bark Surface (S7) Polyvalue Below Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17, 148) Coast Prairie Redox (A16) (MLRA 147, 148) Coast Prairie Redox (A17) Depleted Matrix (F2) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) (LRR N, Sandy Gleyed Matrix (S4) Umbric Surface (F12) (LRR N, MLRA 136, 122) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148, 128, 127, 147) unless disturbed or problematic. striped Matrix (S4) Umbric Surface (F12) (MLRA 127, 147) Striped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) Deplet (inches): 4-6 Type: BED ROUL <ld>Depth (inches): 4-6 MD BET ROUK MD</ld>					
Histosol (A1)			=Reduced Matrix, MS=Masked Sand Grains.		
Thick Dark Surface (A12)	_ Histos _ Histic _ Black _ Hydrog _ Stratifi	ol (A1) Epipedon (A2) Histic (A3) gen Sulfide (A4) ed Layers (A5)	 Polyvalue Below Surface (S8) (MLRA Thin Dark Surface (S9) (MLRA 147, 4 Loamy Gleyed Matrix (F2) Depleted Matrix (F3) 	- A 147, 148)	 2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19) (MLRA 136, 147)
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) wetland hydrology must be present, Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic. strictive Layer (if observed): Type: BED ROCK Depth (inches): 4-6" Hydric Soil Present? Yes X No marks:	Thick I Sandy MLI	Dark Surface (A12) Mucky Mineral (S1) (LRR N, RA 147, 148)	Redox Depressions (F8) ✓ Iron-Manganese Masses (F12) (LRR MLRA 136)		Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and
Type: BEDROUL Depth (inches): <u>Y-G</u> " Hydric Soil Present? Yes <u>X</u> No Primarks: A SOILS WERE HIGHLY DISTURBED WITH VARING COLORS X AND BEDROUK REFUSAL WAS at 4-6" THE VARIOUS MOTTLING [±] UNSORTED GIRAVEL ALUMIUM W	_ Sandy _ Strippe	r Redox (S5) ed Matrix (S6)	Piedmont Floodplain Soils (F19) (ML	RA 148)	
Depth (Inches): 4-6" Hydric Soil Present? Yes X No emarks: A SOILS WERE HIGHAY DISTURBED WITH VARING COLORS A AND BEDROCK REFUGAL WAS at 4-6" THE VARIOUS MOTTLING & UNSORTED GRAVEL ALLUVIUM W					
THE VARIOUS MOTTLING & UNSORTED GRAVEL ALUUVIUM W				Hvdrid	c Soil Present? Yes $ imes$ No
THE VARIOUS MOTTLING & UNSORTED GRAVER ALLUVIUM W		, <u> </u>			
	X	L SOILS WERE AND BEORO	HIGHLY DISTURBED L UK REFUSAL WAS a)1++ VA + 4-6 '	RINH COLORS +
FRACTURED BEDROCK APPENRE DUE TO MISTORIC DISTURBAN		THE VARIOUS	MOTTLING & UNSO	RITED E	GRAVER ALLUVIUM WIT
		FRACTURED R	DEBROCK APPEAR DU	- TO 1	HISTORIC PISTURBANG

W- mat 6/5/2012 - 1 Wetland 9 WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

Project/Site: <u>AEP Big Sandy Pond Claffire</u> Cit	y/County: <u>Louisa, Lawrence</u> Sampling Date: <u>06/05/12</u> State: <u>K/</u> Sampling Point: <u>01</u>
	ction, Township, Range:
Landform (hillslope, terrace, etc.): base of rock face Local	
Subregion (LRR or MLRA): Lat: 38, \8597	36 Long: - 82, 635573 Datum:
Soil Map Unit Name: Dm, Vaf2	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes X No (If no, explain in Remarks.)
Are Vegetation <u>No</u> , Soil <u>No</u> , or Hydrology <u>NO</u> significantly dis	turbed? Are "Normal Circumstances" present? Yes No
Are Vegetation $\underline{\mathcal{MO}}_{-}$, Soil $\underline{\mathcal{MO}}_{-}$, or Hydrology $\underline{\mathcal{MO}}_{-}$ naturally proble	matic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing s	ampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No	Is the Sampled Area within a Wetland? Yes No

freduita (fjareleg) - teeette				
Remarks: PEM/PSS	wetland at base	of cut	rock face.	Previously
disturbed fro	om pond Constru	chon.		
-				

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
	Dry-Season Water Table (C2)
Field Observations:	
Surface Water Present? Yes No X Depth (inches):	
Water Table Present? Yes No <u>></u> Depth (inches):	
Saturation Present? Yes No Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspec	tions), if available:
Remarks: We fland receives hydrology from two sta Sheet flow off the hillsides to the	reams to the west and . North.

110+ W/J/ WIL-1 Wetland

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: Absolute Dominant Indicator Dominance Test worksheet: <u>% Cover Species?</u> Status Number of Dominant Species _____ That Are OBL. FACW, or FAC: (A) 2. · _ · _____ Total Number of Dominant 3. Species Across All Strata: (B) 4._____ Percent of Dominant Species 100<u>°/</u> (A/B) 5. _____ ____ ____ ____ ____ ____ That Are OBL, FACW, or FAC: 6. Prevalence Index worksheet: _____ 7. Total % Cover of: Multiply by: _____ = Total Cover OBL species 130 x 1 = 130 Sapling Stratum (Plot size: _____) FACW species $\frac{70}{140}$ x 2 = $\frac{140}{140}$ 1.(Nono) O x 3 = _____ FAC species 2._____ FACU species _____ x 4 = ____ 3. _____ x 5 = ____ UPL species 4. Column Totals: 200 (A) 270 (B) 5. ______ 6._____ Prevalence Index = B/A = 1.357._____ Hydrophytic Vegetation Indicators: _____ = Total Cover 1 - Rapid Test for Hydrophytic Vegetation Shrub Stratum (Plot size: _____) $\underline{\times}$ 2 - Dominance Test is >50% 1. Salix nigra 30 Ves DRL 2. Sycamore 15 X 3 - Prevalence Index is ≤3.0¹ KI_FACIN _ 4 - Morphological Adaptations¹ (Provide supporting 3. _____ data in Remarks or on a separate sheet) 4 _____ Problematic Hydrophytic Vegetation¹ (Explain) 5. ______ 6._____ ¹Indicators of hydric soil and wetland hydrology must 7._____ be present, unless disturbed or problematic. = Total Cover **Definitions of Five Vegetation Strata:** 01/22.5 Herb Stratum (Plot size: _____) _ves DACI 40 Tuncus offusus Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. 50 yes TYDHA angustiona (7.6 cm) or larger in diameter at breast height (DBH). 3. In sedar - C. vullinpidea 20 ho OB(4. Tappetip rush - T. acuminatus 30 no Sapling - Woody plants, excluding woody vines. OB1 approximately 20 ft (6 m) or more in height and less 5.C.Squarroso 15 no IA(1) than 3 in. (7.6 cm) DBH. ____ 6._____ Shrub - Woody plants, excluding woody vines, 7._____ approximately 3 to 20 ft (1 to 6 m) in height. 8._____ Herb - All herbaceous (non-woody) plants, including 9._____ herbaceous vines, regardless of size, and woody 10._____ plants, except woody vines, less than approximately 3 ft (1 m) in height. 11. ______ _____ 12. Woody vine - All woody vines, regardless of height. 155 ____ = Total Cover Woody Vine Stratum (Plot size: _____) 31/77.5 1. (none) _____ 2. ` 3. Hydrophytic _____ 4. Vegetation Yes X_ No____ 5. ______ Present? _____ = Total Cover Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Desc	ription: (Describe to	o the depth r	needed to docum	nent the i	ndicator	or confirm	the absence	of indicators.)
Dep t h	Matrix			x Features		<u>-</u>		
(inches)	Color (moist)		Color (moist)	%	Type ¹	_Loc ²		Remarks
<u>D-8"</u>	104R6/2	<u>70 </u>	LOYR 4/6	30			Sandy clay	restrictive sand frock
	oncentration, D=Deple	etion, RM=Re	duced Matrix, MS	S=Masked	Sand Gr	ains.		PL=Pore Lining, M=Matrix.
Hydric Soil I	indicators:						Indic	ators for Problematic Hydric Soils ³ :
Black His Hydroge Stratified 2 cm Mu Depleted Thick Da	pipedon (A2)	- (A11)	 Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyer ✓ Depleted Mat Redox Dark S Depleted Darl ∴ Redox Depression Iron-Mangane 	low Surfac rface (S9) d Matrix (l trix (F3) Surface (F k Surface ssions (F8) (MLRA 1 (F2) =6) e (F7) 8)	147, 148)	148) (2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19) (MLRA 136, 147) Red Parent Material (TF2) /ery Shallow Dark Surface (TF12) Other (Explain in Remarks)
	A 147, 148)		MLRA 136		00 (1 12) (
Sandy G Sandy R	Bleyed Matrix (S4) Redox (S5) Matrix (S6)	-	Umbric Surfac	ce (F13) (18) v	dicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
	ayer (if observed):							· · · · · · · · · · · · · · · · · · ·
Type: Depth (inc	ches):8		-				Hydric Soi	Present? Yes No
Remarks:								

W-pr 6/ +/2012-1 injetland 10 Project/Site: <u>AEP Big Sandy Port Closure</u> Project State: <u>KY</u> Sampling Date: <u>b6/07/12</u> State: <u>KY</u> Sampling Point: <u>O1</u> WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Section, Township, Range: Investigator(s): MDT, PR _____ Slope (%): _____ Landform (hillslope, terrace, etc.): Alona Gndfill outfall Local relief (concave, convex, none): Lat: 38.187993 Long: -82, 633528 Datum: Subregion (LRR or MLRA): Soil Map Unit Name: ____/a F2 NWI classification: 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 X No Are Vegetation 10, Soil 485, or Hydrology 100 significantly disturbed? Are Vegetation $\mathcal{N}_{\mathcal{O}}$, Soil $\mathcal{N}_{\mathcal{O}}$, or Hydrology $\mathcal{N}_{\mathcal{O}}$ naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Yes _____ No _____ Yes ____ No _____ Hydrophytic Vegetation Present? Is the Sampled Area Hydric Soil Present? Yes X No _____ No _____ No _____ Wetland Hydrology Present? Yes X No _____ within a Wetland? Yes X No _____ Remarks: PEM wetland that porallels landfill outfall Portion of wetlend ethends up stope as well. well. well HYDROLOGY Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) ____ Surface Soil Cracks (B6) Primary Indicators (minimum of one is required; check all that apply) ___ Sparsely Vegetated Concave Surface (B8) ___ True Aquatic Plants (B14) Surface Water (A1) ____ Hydrogen Sulfide Odor (C1) High Water Table (A2) ______ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Moss Trim Lines (B16) ____ Water Marks (B1) Presence of Reduced Iron (C4) ___ Dry-Season Water Table (C2) ____ Sediment Deposits (B2) ____ Recent Iron Reduction in Tilled Soils (C6) ___ Crayfish Burrows (C8) ____ Drift Deposits (B3) ___ Saturation Visible on Aerial Imagery (C9) Thin Muck Surface (C7) ____ 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) X FAC-Neutral Test (D5) Aquatic Fauna (B13) Field Observations: Yes _____ No ____ Depth (inches): ______ Surface Water Present? Water Table Present? Wetland Hydrology Present? Yes K. No Saturation Present? (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: wetland abots landfill outfall.

W-pr 6/+/ 0010-1 Wetland 10

Absolute Dominant indicator Scover Socielle Dominant indicator 1. S. Gover Socielle Number of Dominant Species (A) 2. That Are OBL, FACW, or FAC: (A) 3. Statum (Pot size) (B) 6. That Are OBL, FACW, or FAC: (A) 7. That Are OBL, FACW, or FAC: (A) 8. Parcent of Dominant Species (A) 6. That Are OBL, FACW, or FAC: (A) 7. That Are OBL, FACW, or FAC: (A) 8. Statum (Pot size) (A) 1. FACU species X =	VEGETATION (Five Strata) – Use scientific		-		Sampling Point:
1	Tree Stratum (Plot size:)				Dominance Test worksheet:
2 Total Number of Dominant (b) 3. Second Tominant Species (c) 5. Second Tominant Species (c) 6. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Second Tominant Species (c) 7. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Second Tominant Species (c) 7. Second Tominant Species (c) 8. Se					
3. Species Acress All Strate: (B) 4. Species Acress All Strate: (B) 5. Species Acress All Strate: (A) 6. That More Obsections (AB) 7. That More Obsections (AB) 7. That More Obsections Multiply Dyr 0BL species 1. That More Obsections Multiply Dyr 7. Species Acress All Strate: Multiply Dyr OBL species Multiply Dyr 9. Species Acress All Strate: Multiply Dyr OBL species Multiply Dyr 9. Species Acress All Strate: Multiply Dyr OBL species Multiply Dyr 1. Species Acress All Strate: That More Obsecies Multiply Dyr OBL species Multiply Dyr 1. Species Acress All Strate: Multiply Dyr OBL species Multiply Dyr OBL species Multiply Dyr 2. Strate: Multiply Dyr Multiply Dyr Multiply Dyr Multiply Dyr 2. Strate: Multiply Dyr Multiply Dyr Multiply Dyr Multiply Dyr 2. Strate: Multiply Dyr					
4. Percent of Dominant Species (AB) 5. That Are OBL, FACU, DEDL, FACU, SPECIES (AB) 7. Total Cover Total Cover OBL, FACU, DEDL, FACU, DEDL, FACU, DEDL, FACU, SPECIES (AB) 1. Total Cover FAC species X =					
5.					
6.					
	6				(==)
Sapina Stratum (Plot size:	7		<u></u>	•	
1	Sanling Stratum (Plot size:		= Total Co	ver	
2					
3. FACU species x 4 = 4. S S 5. Column Totals: (A) (B) 6. Prevalence Index = B/A = (Pluster) 7. Prevalence Index = B/A = (Pluster) 1. Yespecies (A) (B) 2. Yespecies (A) (Pluster) 3. Yespecies (A) (Pluster) 3. Yespecies (A) (Pluster) 3. Yespecies (A) (Pluster) 3. Yespecies (Pluster) (Pluster) 3. Yespecies (Pluster) (Pluster) 4. Yespecies (Pluster) (Pluster) 5. Yespecies (Pluster) (Pluster) 6. Yespecies (Pluster) (Pluster) 1. Yespecies (Pluster) (Pluster) 2. Yespecies (Pluster) (Pluster) 3. Yespecies (Pluster) (Pluster) 1. Yespecies (Pluster) (Pluster) 2. <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
4. UPL species x 5 = 5. Column Totals: $ 1 \leq \dots$ (A) $ 1 \leq \dots$ (B) 7. Total Cover Prevalence Index = B/A =					
5. Column Totals: (A) (B) 6.					
6.					
7.					
Shrub Stratum (Plot size:)					
1.			= Total Co	ver	
2.					
3.					
4.					
5.					data in Remarks or on a separate sheet)
6.					Problematic Hydrophytic Vegetation ¹ (Explain)
7.					
Herb Stratum (Plot size:)				· · · · · · · · · · · · · · · · · · ·	¹ Indicators of hydric soil and wetland hydrology must
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). 3. For Grade C 4. Construction 5. Construction 6. Construction 7. Construction 8. Construction 9. Construction 10. Construction 11. Construction 12. Construction 13. Construction 14. Construction 15. Construction 16. Construction 7. Construction 14. Construction 15. Construction 16. Construction 17. Construction 18. Construction 19. Construction 10. Construction 11. Construction 12. Construction 13. Construction 14. Construction 15. Construction 16. Construction			= Total Co	ver	
2. Type: 3.0 12 00 approximately 20 ft (6 m) or more in height and 3 in. 3. Fox fedge 15 00 00 Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) or larger in diameter at breast height (DBH). 4. 0 30 10 Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. 8.		2-	20.1	00,	
Image: Second State Image: Second State<	1. Jypha latitolia	- 70		USL	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 2 in
4.	2. Typha archistolia				(7.6 cm) or larger in diameter at breast height (DBH).
5.	, O		No	OBC	Sapling - Woody plants, excluding woody vines
6.					approximately 20 ft (6 m) or more in height and less
7.					than 3 in. (7.6 cm) DBH.
8					Shrub - Woody plants, excluding woody vines,
9.					approximately 3 to 20 ft (1 to 6 m) in height.
10.					
11					plants, except woody vines, less than approximately
12. IIS = Total Cover Woody Vine Stratum (Plot size:) 1. $23/57.5$ 1.					3 ft (1 m) in height.
Woody Vine Stratum (Plot size:) $1 \leq =$ Total Cover 1. $23/57.5$ 2.				·	Woody vine – All woody vines, regardless of height.
1.		115	= Total Co	ver	
2.					
3.					
4 Hydrophytic 5 = Total Cover Yes No					
5 = Total Cover Yes No					
= Total Cover					Vegetation Present? Vos No
				ver	
	Remarke: (Include photo numbers here or on a sonarat				
		e 31166r.)			

Sampling Point:

Profile Desc	cription: (Describe t	o the depth	needed to docum	nent the in	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix			Features			_	
(inches)	Color (moist)		Color (moist)	%	Type'	_Loc ²	<u>Texture</u>	Remarks
0-9	107R6/2	70 _	104K 4/6	30		M	silty chy	·
						<u></u>		
							#	
<u> </u>							waanne	
			· · · · · · · · · · · · · · · · · · ·			·		
							·····	
					<u> </u>		No	
¹ Type: C=C	oncentration, D=Deple	etion, RM=R	educed Matrix, MS	=Masked	Sand Gra	ains.		=Pore Lining, M=Matrix.
Hydric Soil	Indicators:						Indica	tors for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface					cm Muck (A10) (MLRA 147)
	oipedon (A2)		Polyvalue Bel				·	oast Prairie Redox (A16)
	stic (A3)		Thin Dark Su		•	47, 148)		(MLRA 147, 148)
	en Sulfide (A4)		Loamy Gleye		F2)			edmont Floodplain Soils (F19)
	d Layers (A5)		Depleted Mat					(MLRA 136, 147) ed Parent Material (TF2)
	ıck (A10) (LRR N) d Below Dark Surface	(A11)	Depleted Dark					ery Shallow Dark Surface (TF12)
	ark Surface (A12)	(((1))	Redox Depre					ther (Explain in Remarks)
	lucky Mineral (S1) (L	RR N,	Iron-Mangane			LRR N,		
	A 147, 148)		MLRA 136					
Sandy G	Bleyed Matrix (S4)		Umbric Surfa					cators of hydrophytic vegetation and
	Redox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14		etland hydrology mu s t be present,
	Matrix (S6)						ur	less disturbed or problematic.
	Layer (if observed):							
			_					X
Depth (in	ches):						Hydric Soil	Present? Yes // No
Remarks:								

					6/7/2012	- 2
WET			ORM – Eas	いいしょうしんしょうしんしょうしんしょうしんしょうしんしょうしんしょうしんしょう	Riedmont	
Project/Site: <u>AEP</u> <u>Big</u> Applicant/Owner: <u>AEP</u> Investigator(s): <u>MDT</u> , <u>P</u> Landform (hillslope, terrace, etc Subregion (LRR or MLRA): Soil Map Unit Name: <u></u> Soil Map Unit Name: <u></u> Are climatic / hydrologic condition Are Vegetation <u></u> , Soil Are Vegetation <u></u> , Soil	Sand y Pand (P .): La poins on the site typical <u>965</u> , or Hydrology <u>No</u> , or Hydrology <u></u> <u>S</u> – Attach site	Isture ProjectCity/0 Sect Local re at: 38 18482 for this time of year? 1000000000000000000000000000000000000	County: <u>Lour</u> ion, Township, lief (concave, d P Yes <u>X</u> N rbed? A natic? (mpling poir	State: K Range: Convex, none): Long: NWI class o (If no, explain in are "Normal Circumstance f needed, explain any ans ht locations, transed	Sampling Date: Sampling Point Slope B 7 Datum sification:/ n Remarks.) s" present? Yes swers in Remarks.)	€ (%): : 2 2 2 2 2 2
Hydrophytic Vegetation Prese Hydric Soil Present? Wetland Hydrology Present?	nt? Yes <u>×</u> Yes <u>×</u>	No	Is the Samp	oled Area etland? Yes	No	
Wetland Hydrology Present?	Yes <u>×</u>	No				
Wetland Hydrology Indicator Primary Indicators (minimum of Surface Water (A1) High Water Table (A2) Vater Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)		CK all that apply) True Aquatic Plants Hydrogen Sulfide Od Oxidized Rhizosphe Presence of Reduce Recent Iron Reducti Thin Muck Surface (Other (Explain in Re	dor (C1) rres on Living F ed Iron (C4) ion in Tilled So (C7)	Coots (C3) Surface S Sparsely Drainage Moss Trir Dry-Seas ils (C6) Crayfish I Saturation	on Water Table (C2)	urface (B8) gery (C9)
 Iron Deposits (B5) Inundation Visible on Aeri Water-Stained Leaves (B5) 			anars)	Geomorp Shallow A Microtopo	hic Position (D2) Aquitard (D3) ographic Relief (D4))
Aquatic Fauna (B13) Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Yes No _>	Depth (inches): Depth (inches): _ Depth (inches):		FAC-Neu	ssent? Yes	No
Describe Recorded Data (stre Remarks:	am gauge, monitoring	g well, aerial photos, pr	evious inspect	ions), if available:		

W-pr6/7/2012-2 Wetland 11

Sampling Point:

	Absolute Dominant Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size:) 1	<u>% Cover Species? Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
23		Total Number of Dominant 7 Species Across All Strata: (B)
4 5		Percent of Dominant Species 106 That Are OBL, FACW, or FAC:(A/B)
6		
7		Prevalence Index worksheet:
	= Total Cover	$\frac{\text{Total \% Cover of:}}{\text{OBL species}} \frac{100}{2} \text{ x 1 = } \frac{100}{2}$
Sapling Stratum (Plot size:)		
1		FACW species x 2 =
2		FAC species x 3 =
3		FACU species x 4 =
4		UPL species x 5 = Column Totals: $/00$ (A) $/00$ (B)
5		
6		Prevalence Index = B/A =/
	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)		$- \times$ 1 - Rapid Test for Hydrophytic Vegetation
1		2 - Dominance Test is >50%
2		_∕⁄∠ 3 - Prevalence Index is ≤3.0 ¹
3		4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4		Problematic Hydrophytic Vegetation ¹ (Explain)
5		
6		¹ Indicators of hydric soil and wetland hydrology must
7		be present, unless disturbed or problematic.
Herb Stratum (Plot size:)	= Total Cover	Definitions of Five Vegetation Strata:
	<u>70 Yes OBL</u>	Tree – Woody plants, excluding woody vines,
	1 1501	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
2. <u>Carex vulpinoidea</u> 3. <u>Typha angustitolia</u>	15 N OPL	
4		Sapling – Woody plants, excluding woody vines,
5		approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
6 7		Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
8		Herb – All herbaceous (non-woody) plants, including
9		herbaceous vines, regardless of size, and woody
10		plants, except woody vines, less than approximately 3 ft (1 m) in height.
11		
12	100 = Total Cover $\frac{20}{50}$	Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size:)	Total Cover 50	
1		
2		
3		
4		Hydrophytic
5		Present? Yes <u>No</u>
	= Total Cover	
Remarks: (Include photo numbers here or on a separate	sheet.)	

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

onth	ription: (Describe t Matrix	o the dept		x Features			the absence of file	licators.
epth nches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²	Texture	Remarks
0-9	10YR 6/2	70	104R 4/6	30	C	M	silty day	
		·			«			
						········		
	<u></u>	·						
	<u></u>	<u> </u>				•un	······	
		<u> </u>						
	ncentration, D=Depl	etion, RM=	Reduced Matrix, M	S=Masked	Sand Gr	ains.		e Lining, M=Matrix.
	ndicators:							for Problematic Hydric Soils
Histosol			Dark Surface		(00) (1			uck (A10) (MLRA 14 7)
	ipedon (A2)		Polyvalue Be					Prairie Redox (A16)
Black His			Thin Dark Su			47, 148)		RA 147, 148) ont Floodplain Soils (F19)
	n Sulfide (A4) Layers (A5)		Depleted Ma		-2)			RA 136, 147)
	ck (A10) (LRR N)		Redox Dark		6)			rent Material (TF2)
	Below Dark Surface	(A11)	Depleted Da	•				nallow Dark Surface (TF12)
	rk Surface (A12)	(Redox Depre					Explain in Remarks)
	ucky Mineral (S1) (L	RR N,	Iron-Mangan			LRR N,		· ····,
	147, 148)		MLRA 13					
Sandy G	leyed Matrix (S4)		Umbric Surfa	ace (F13) (MLRA 13	6, 122)	³ Indicator	s of hydrophytic vegetation and
	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14		hydrology must be present,
Stripped	Matrix (S6)						unless	disturbed or problematic.
strictive L	ayer (if observed):							
Туре:								1.5
Depth (inc	:hes):						Hydric Soil Pres	ent? Yes X No
marks:								

W-Pr6/7/2012 - 3 Wetland 12 WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

Project/Site: AEL Rig Sandy Point Closure	e Project City/County: / Duis	a lawnence Sampling Date: 06/07/11
Applicant/Owner: ΛEQ		<u>a lawrence</u> Sampling Date: <u>06/07/12</u> State: <u>KY</u> Sampling Point: <u>03</u>
Investigator(s): <u>MDT</u> , <u>PR</u>	Section, Township, R	carde.
Landform (billolono torraço etc.):		nvex, none): <u></u> Slope (%):
		ong: <u>-82.631769</u> Datum:
Soil Map Unit Name:		NWI classification: <u> A / 9</u>
Are climatic / hydrologic conditions on the site typical		
Are Vegetation <u>Mo</u> , Soil <u>Mo</u> , or Hydrology <u>K</u>	<u>)</u> significantly disturbed? Are	e "Normal Circumstances" present? Yes $__X_$ No
Are Vegetation <u>No</u> , Soil <u>No</u> , or Hydrology <u>N</u>	naturally problematic? (If r	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site	map showing sampling point	locations, transects, important features, etc.
Hydric Soil Present? Yes X Wetland Hydrology Present? Yes X	No Is the Sample No within a Weth No within a Weth	and? Yes No
Remarks: PEM wetland lo	cated in former l	andfill out-fall.
HYDROLOGY		
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; che	ck all that apply)	\underline{X} Surface Soil Cracks (B6)
Surface Water (A1)	_ True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
•	_ Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
— .,	_ Oxidized Rhizospheres on Living Ro	
	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2)	 Recent Iron Reduction in Tilled Soils Thin Muck Surface (C7) 	(C6) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3) X 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:		
	Depth (inches):	
	Depth (inches):	
	Depth (inches): V	Vetland Hydrology Present? Yes 🗶 No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring	well, aerial photos, previous inspection	ns), if available:
Remarks:		
Remarks: Algor most and E	platuce Croichs	noke
0		

w- pr6/7/2012-3 wetland 12

VEGETATION	Five Strata) – Use scientific	names of plants.

Sampling Point: _____

	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:) 1)		Species? Status	Number of Dominant Species 3 (A)
2 3			Total Number of Dominant Species Across All Strata:(B)
4 5			Percent of Dominant Species That Are OBL, FACW, or FAC:OO^^/_ (A/B)
6			Prevalence Index worksheet:
7			Total % Cover of:Multiply by:
Sapling Stratum (Plot size:)		= Total Cover	OBL species $2 x_1 = 7.1$
1			FACW species 43 x 2 = 86
2			FAC species x 3 =3
3			FACU species x 4 =
4			UPL species x 5 =
5			Column Totals: (0.5) (A) (0.5) (B)
6			Prevalence Index = $B/A = 1.69$
7			
		= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)	۱	VIII M	\cancel{X} 1 - Rapid Test for Hydrophytic Vegetation \cancel{X} 2 - Dominance Test is >50%
1. Salix nigra		Yes OBL	X_2 - Dominance Test is >50% X_3 - Prevalence Index is $\leq 3.0^1$
2			
3			 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
4			Problematic Hydrophytic Vegetation ¹ (Explain)
5			
6			¹ Indicators of hydric soil and wetland hydrology must
7	1	= Total Cover	be present, unless disturbed or problematic.
Herb Stratum (Plot size:)			Definitions of Five Vegetation Strata:
1. Corex Iurida	5	no OBL	Tree – Woody plants, excluding woody vines,
2. Corex Unlpinoideg	15	YES DBL	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
3. Monpellaport - L. nummularia	40	JUS FACW	(7.0 cm) of larger in diameter at breast height (DBH).
4. Puner corpus		no FAC	Sapling – Woody plants, excluding woody vines,
5. Boneset - E. perfolicitum	3	no FACW	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
6			
7.			Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
8	<u> </u>		
9			Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
10			plants, except woody vines, less than approximately
11			3 ft (1 m) in height.
12			Woody vine - All woody vines, regardless of height.
Woody Vine Stratum (Plot size:		= Total Cover	
1	12.8	156	
2			
3			
4			Hydrophytic
5			Vegetation Present? Yes No
		= Total Cover	
Remarks: (Include photo numbers here or on a separate			
	····,		

601

w- pr 6/7/2012-3 Wetland 12

SOIL									Sa	ampling Point	
Profile Desc	ription: (Describe t	o the dep	oth needed	to docu	ment the	indicator	or confirm	the absenc	e of indicato	rs.)	
Depth	Matrix			Red	ox Feature	s					
(inches)	Color (moist)	%	Color (noist)	%	Type ¹	Loc ²	Texture		Remarks	
0-10	IDYA 6/1	70	IDYK	4/6	30	C	Milly C	lay			
		<u> </u>						1			
									·		
					·•			·	·		
			. <u> </u>						·		
		<u></u>	·					·····			
									·		
						• <u> </u>		•	·		
			······			• <u> </u>					
¹ Type: C=Co	ncentration, D=Depl	etion, RM	=Reduced	Matrix, M	IS=Maske	d Sand G	rains.			ng, M=Matrix.	
Hydric Soil I	ndicators:							Indie	cators for Pr	oblematic Hy	dric Soils ³ :
Histosol	(A1)			k Surfac					2 cm Muck (A	10) (MLRA 1	47)
Histic Ep	ipedon (A2)						MLRA 147,	148)	Coast Prairie	Redox (A16)	
Black His							147, 148)		(MLRA 14	-	
	n Sulfide (A4)				ed Matrix	(F2)				odplain Soils	(F19)
Stratified					atrix (F3)				(MLRA 13		
	ck (A10) (LRR N)				Surface (I	,				Material (TF2)	
	Below Dark Surface	e (A11)			ark Surface			Very Shallow Dark Surface (TF12) Other (Explain in Remarks)			
	rk Surface (A12)			-	essions (F	-			Other (Explai	n in Remarks)
	ucky Mineral (S1) (L	KK N,		MLRA 1	nese Mass	ses (F12)	(LKK N,				
	. 147 , 148) leyed Matrix (S4)				ace (F13)		36 122)	³ In	diantara of h	/drophytic veg	notation and
	edox (S5)) (MLRA 14			ology must be	
	Matrix (S6)			unoneri	oouplaint			•	-	bed or proble	• •
	ayer (if observed):							Т			nauç.
										. *	
								Hudaia O.a	11 Due	X	
	:hes):							Hydric So	il Present?	Yes	No
Remarks:											

W-pr6/7/2012-4 Wetland 13

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

	endy Bon	Closure			Sampling Date: 06/07/12		
Applicant/Owner: AEP				State: <u>_K</u> Y	Sampling Point:		
Investigator(s): <u>MDT</u> P	2	·····	Section, Township	o, Range:			
Landform (hillslope, terrace, et	c.):	Loo	cal relief (concave	, convex, none):	Slope (%):		
Subregion (LRR or MLRA):	Subregion (LRR or MLRA): Lat: 38.184 62.4 Long: -82.631001 Datum:						
Soil Map Unit Name:					sification: n/a		
Are climatic / hydrologic conditi	ions on the site	e typical for this time of ye	ar? Yes <u>X</u>				
Are Vegetation <u>NO</u> , Soil <u>/</u>					es" present? Yes 📈 No		
Are Vegetation 1/10_, Soil 1/				(If needed, explain any an			
• •					cts, important features, etc.		
Hydrophytic Vegetation Prese Hydric Soil Present? Wetland Hydrology Present?	Ye	es X No es X No es X No	within a W	npled Area /etland? Yes	K No eeps in dam.		
HYDROLOGY							
Wetland Hydrology Indicato			· · · · · · · · · · · · · · · · · · ·	Secondary In	dicators (minimum of two required)		
Primary Indicators (minimum	<u>of one is requi</u>				Soil Cracks (B6)		
Surface Water (A1)		True Aquatic P			Vegetated Concave Surface (B8)		
High Water Table (A2)		Hydrogen Sulfi			Patterns (B10)		
$\underline{\times}$ Saturation (A3) $\underline{\times}$ Water Marks (B1)			ospheres on Living educed Iron (C4)		m Lines (B16) son Water Table (C2)		
Sediment Deposits (B2)			duction in Tilled S		Burrows (C8)		
Drift Deposits (B3)		Thin Muck Surf			n Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)		Other (Explain	in Remarks)		or Stressed Plants (D1)		
Iron Deposits (B5)				_X Geomorp	ohic Position (D2)		
Inundation Visible on Aer		7)			Aquitard (D3)		
Water-Stained Leaves (B	9)				ographic Relief (D4)		
Aquatic Fauna (B13)					utral Test (D5)		
Field Observations: Surface Water Present?	Yes X	No Depth (inches): 3				
Water Table Present?		No Depth (inches					
Saturation Present?		No Depth (inches		Wetland Hydrology Pre	esent? Yes <u>X</u> No		
(includes capillary fringe) Describe Recorded Data (stre							
	am gauge, mo	initioning wen, aenai prioto	s, previous inspe	cuons), il avaliable.			
Remarks:							
Remarks.							

W-pr 6/7/2012-9 Wetland 13

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

Sampling Point:

	Absolute		Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species		Number of Dominant Species 2
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 1001 (A/B)
6			<u> </u>	Prevalence Index worksheet:
7				
		= Total Co	ver	Total % Cover of:, Multiply by:
Sapling Stratum (Plot size:)				OBL species $60 \times 1 = 60$
1				FACW species $2 \times 2 = 1$
2				FAC species x 3 =
3			······································	FACU species x 4 =
4		<u></u>	··	UPL species x 5 =
5		<u> </u>		UPL species $x 5 =$ Column Totals: 73 (A) 96 (B)
6				
7				Prevalence Index = $B/A = 1, 32$
		= Total Co	ver	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)				$\frac{X}{X}$ 1 - Rapid Test for Hydrophytic Vegetation
1			·	\underline{X} 2 - Dominance Test is >50%
2				\sim 3 - Prevalence Index is $\leq 3.0^1$
3				4 - Morphological Adaptations ¹ (Provide supporting
4				data in Remarks or on a separate sheet)
5				Problematic Hydrophytic Vegetation ¹ (Explain)
6				
7		<u> </u>		¹ Indicators of hydric soil and wetland hydrology must
1.		= Total Co		be present, unless disturbed or problematic.
Herb Stratum (Plot size:)	<u>_</u>	- 10121 CO	vei	Definitions of Five Vegetation Strata:
1. Carex Lupulina	30	yes	OBL	Tree – Woody plants, excluding woody vines,
	5	no	FACU	approximately 20 ft (6 m) or more in height and 3 in
2 TIMAY AG GALADACAN			1	(7.6 cm) or larger in diameter at breast height (DBH).
2. COnciaa Goldenrod		No	$1 \land \land \land \land \land \land$	
3. Eupertorium maculatum	5		FACW	Sapling - Woody plants, excluding woody vines
3. Euperforium maculatum 4. Elebearis acientaris	5	<u>no</u>	OBL	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
3. Euperforium maculetum 4. Elebearis acientaris 5. Typha anguistifolia	5 10	<u>No</u>	OBL DBL	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
3. Euperforium maculetum 4. Elebearis acientaris 5. Typha angrustifolia 6. Taportip rush (Junus acumina	5 10 10 10	No No 105	OBL DBL	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
3. Euperforium maculatum 4. Elebearis <u>Acientaris</u> 5. Typha <u>angrustifolia</u> 6. Japortip rush (Juneus acumina 7. Carex scoperia	5 10 0 10 0 0 10 0 0 0 0 0 0 0 0 0 0 0 0	no 1es no	OBL OBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
3. Euperforium maculetum 4. Elebear: 5 acientar: 5 5. Typha angrustifolia 6. Japortip rush (Juneus acumina 7. Caret scoparia 8.	5 10 0 10)20 3	No No Jes No	OBL DBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
3. Euperforium maculatum 4. Elebearis <u>Acientaris</u> 5. Typha <u>angrustifolia</u> 6. Japortip rush (Juneus acumina 7. Carex scoperia	5 10 0 10)20 3	No No Jes No	OBL DBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including
3. Euperforium maculetum 4. Elebear: 5 acientar: 5 5. Typha angrustifolia 6. Japortip rush (Juneus acumina 7. Caret scoparia 8.	5 10 0 10 20 3	<u>no</u> <u>1es</u>	OBL DBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately
3. Euperforium maculatum 4. Elebearis acientaris 5. Typha anguistifolia 6. Taportip rush (Juneus acumina 7. Carex scoppinia 8	5 10 0 10 20 3	<u>No</u> <u>No</u> <u>No</u>	OBL DBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
3. Euperforium maculatum 4. Elebear: 5 acientar: 5 5. Typha angrustifolia 6. Japortip rush (Juneus acumina 7. Carex scoperia 8 9	-5 -10 -0 	No No No No	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
3. Euperforium maculectum 4. Elebearis acientaris 5. Typha angrustifolia 6. Japortip rush (Juneus acumina 7. Caret scoparia 8	-5 -40 -0 	<u>No</u> <u>Jes</u> <u>No</u> = Total Co	OBL DBL DBL FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately
3. Euperforium maculetum 4. Elebearis acientaris 5. Typha angrustifolia 6. Japertip rush (Juneus acumina 7. Caret scoperria 8 9 10	-5 -40 -0 	<u>No</u> <u>Jes</u> <u>No</u> = Total Co	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
3. Euperforium maculectum 4. Elebearis acientaris 5. Typha angrustifolia 6. Japortip rush (Juneus acumina 7. Caret scoparia 8	-5 -10 -0 	No No No No	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
3. Eupliforium maculatum 4. Elebaaris <u>Acianaris</u> 5. Typha <u>Angrustifolia</u> 6. <u>Tapertip</u> cush (Juneus acumina 7. <u>Carex scoparia</u> 8 9 10 11 12 Woody Vine Stratum (Plot size:)	5 10 0 3 3 73 14.6/	$\frac{N \circ}{\sqrt{0.5}}$ $= Total Co$	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
3. Eupliforium maculatum 4. Elebaaris 5. Typha angrustifolia 6. Taportip rush (Juneus acumira 7. Caret scoparia 8	5 40 0 3 3 73 14.6/	<u>No</u> <u>Jes</u> <u>No</u> = Total Co <u>3b</u> , s	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height.
3. Eupliforium maculatum 4. Elebaciris aciantaris 5. Typha angrustifolia 6. Tapertip rush (Junus acumina 7. Carex sceparia 8	5 40 0 3 	$\frac{N \circ}{100}$	OBL DBL DBL FACU	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic
3. Eupliforium maculatum 4. Elebaaris aciantis 5. Typha angrustifolia 6. Depertie Cush (Junius acumina) 7. Carety scoparia 8.	5 10 0 3 3 	<u>No</u> <u>165</u> <u>No</u> = Total Co <u>36,5</u>	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation
3. Eupciforium maculcotum 4. Elebcar:s acicular:s 5. Typha angrustifolia 6. Tapertip rush (Juneus acumina 7. Carex sceparia 8	5 40 0 3 3 73 14.6/	<u>No</u> <u>165</u> <u>No</u> = Total Co <u>36,5</u>	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation
3. Euperforium maculectum 4. Elebear:s acientar:s 5. Typha angrustifolia 6. Tapertip rush (Juneus acumina 7. Carex scoparia 8	5 40 0 3 	$\frac{N \circ}{100}$	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation
3. Eupertorium maculeutum 4. Elebear: 5 acientar: 5 5. Typha angustifolia 6. Depertip rush (Junius acumina 7. Carex scoperia 8. 9. 10. 11. 12. 3. 4.	5 40 0 3 	$\frac{N \circ}{100}$	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation
3. Euperforium maculectum 4. Elebear:s acientar:s 5. Typha angrustifolia 6. Tapertip rush (Juneus acumina 7. Carex scoparia 8	5 40 0 3 	$\frac{N \circ}{100}$	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation
3. Euperforium maculectum 4. Elebear:s acientar:s 5. Typha angrustifolia 6. Tapertip rush (Juneus acumina 7. Carex scoparia 8	5 40 0 3 	$\frac{N \circ}{100}$	Ver	 approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation

SOIL

Sampling Point:

Profile Desc	ription: (Des	cribe to	the dept	h needed to docu	ment the in	ndicator	or confirm	the absenc	e of indic	ators.)	
Depth	Ma	ıtrix		Red	ox Features						
(inches)	Color (moi	<u>st)</u>	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-8	109K 4	0/2	70	10YR 4/6	30	$\underline{}$	m	sitty .	clay		
		/									
							····	<u> </u>			
		<u>-</u>						·			
							<u></u>				
							••••••				
							<u> </u>				
									_		
	oncentration D	=Denlet	ion RM=	Reduced Matrix, M	 S=Masked	Sand Gra	ains	² Location:	Pi =Pore l	Lining, M=Matrix.	
Hydric Soil		Depier								Problematic Hyd	ric Soils ³
Histosol				Dark Surfac	e (S7)					k (A10) (MLRA 147	
	pipedon (A2)			Polyvalue B		ce (S8) (N	ILRA 147.			airie Redox (A16)	
Black Hi				Thin Dark S						147, 148)	
	n Sulfide (A4)			Loamy Gley						Floodplain Soils (F	19)
	Layers (A5)			_> Depleted M	atrix (F3)					136, 147)	
	ick (A10) (LRR			(Redox Dark	Surface (F	6)				nt Material (TF2)	
	l Below Dark S		A11)	Depleted Date						llow Dark Surface (TF12)
	ark Surface (A1			Redox Depr					Other (Ex	plain in Remarks)	
	lucky Mineral (S1) (LR I	RN,	Iron-Manga		es (F12) (LRR N,				
	147, 148)			MLRA 1				3.		F 1 1 1 1 1	
	ileyed Matrix (S	54)		Umbric Surf						of hydrophytic vegel	
	edox (S5)			Piedmont F	loodplain Se	olis (F19)	(WILRA 14			ydrology must be p sturbed or problema	
	Matrix (S6) _ayer (if obser	heve					····	1	uniess us		шс.
										N (
Depth (inc		·····						Hydric So	il Presen	t? Yes	No
				······································				Inyune oc			NO
Remarks:											
						*					

Project/Site: AFP B16 SATUR	AND DETERMINATION DA		ountains and Piedmont
Applicant/Owner: <u>ACP</u>	24 POND CLOSURE		
Applicant/Owner: <u>Att</u>			HUNEVEL Sampling Date: 10/15/16
CAD II	•		State:/ Sampling Point:
Investigator(s):	IDT	Section, Township, Range: _	ę
I an alfamar (la III a la ara da anno a da Ar	Town Quality	Local relief (concave, convex, n	one):
Subregion (LRR or MLRA):	Lat: 38.1	79671, Lona: -	82,625342 Datum
Soil Man Unit Name: DA	ShF		Stope (%): Solution: Datum: NWI classification: NA
Are climatic / hydrologic conditions			
Are Vegetation $\underline{\mathcal{N}}$, Soil $\underline{\mathcal{N}}$			
	. 1		al Circumstances" present? Yes No
Are Vegetation/, Soil/	, or Hydrology <u>P</u> naturally	problematic? (If needed,	, explain any answers in Remarks.)
SUMMARY OF FINDINGS	 Attach site map showi 	ng sampling point locat	ions, transects, important features,
Hydrophytic Vegetation Present?		is the Sampled Area	
Hydric Soil Present?	Yes <u> </u>		Yes No
Remarks:		_	
* NETLAND SOILS	OBSERVED INPACTED	By AMD	
HYDROLOGY			
Wetland Hydrology Indicators:			Secondary Indicators (minimum of two require
8	one is required; check all that appl		
Surface Water (A1)	True Aquatio		Sparsely Vegetated Concave Surface (Bi
High Water Table (A2)		ulfide Odor (C1) izospheres on Living Roots (C3)	Drainage Patterns (B10)
Water Marks (B1)		Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2)	6º —	Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift Deposits (B3)	Thin Muck S	Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Expla	ain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	(57)		Geomorphic Position (D2)
 Inundation Visible on Aerial Water-Stained Leaves (B9) 	magery (B7)		Shallow Aquitard (D3)
Aquatic Fauna (B13)			FAC-Neutral Test (D5)
Field Observations:			
	∕es <u> </u>	nes): 3 "	
	∕es No _ <u>メ_</u> Depth (inch		
	′es 🔀 No Depth (inch	nes): <u>Sur Frace</u> Wetland	l Hydrology Present? Yes 🔜 No
(includes capillary fringe)	n gauge, monitoring well, aerial ph	notos previous inspections) if a	vailable:
	, gauge,		
Remarks:			
1 To server the server of	and a free a factor atom to the	a the late a the answer	
	OCHIED AT TOE.		
	TREAM FLOWS IN	TO WOTLAND	
EpHemenal S			
•		ADDITIONAL HUI	DRULOAU
÷	ALSO PROVIDES	ADDITIONAL HYL	DROLORY

W-MPT-101512-01

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

VEGETATION (Five Strata) – Use scientific na	imes of	plants.		Sampling Point:
Tree Stratum (Plot size:)	Absolute	Dominant Species?	Indicator	Dominance Test worksheet:
1. SALIX MGRA				Number of Dominant Species
2		~		That Are OBL, FACW, or FAC: (A)
3				Total Number of Dominant Species Across All Strata:
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC:/OO (A/B)
6				That Are OBL, FACW, or FAC:OO (A/B)
7				Prevalence Index worksheet:
		= Total Co	ver	Total % Cover of:Multiply by:
Sapling Stratum (Plot size:)	•			OBL species $54 \times 1 = 54$
1. SHUX NIGNA-	_10	<u> </u>	OBL	FACW species 49 x 2 = 139
2. GRAXINUS OCCIDENTIALIS	_/0_		FREW	FAC species 35 x 3 = 75
3				FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: <u>M8</u> (A) <u>ZGF</u> (B)
6				Prevalence Index = B/A = 1.8
7				Hydrophytic Vegetation Indicators:
	20	= Total Co	ver	1 - Rapid Test for Hydrophytic Vegetation
<u>Shrub Stratum</u> (Plot size:) 1. <u>Nosa palvetets</u>	2	~	ORI	∠ 2 - Dominance Test is >50%
				\swarrow 3 - Prevalence Index is $\leq 3.0^{1}$
2				4 - Morphological Adaptations ¹ (Provide supporting
3				data in Remarks or on a separate sheet)
5				Problematic Hydrophytic Vegetation ¹ (Explain)
5				
7				¹ Indicators of hydric soil and wetland hydrology must
···		= Total Co	ver.	be present, unless disturbed or problematic.
Herb Stratum (Plot size:)		10101 00		Definitions of Five Vegetation Strata:
1. SWFET FLAH - Acorus calamus			OBL	Tree - Woody plants, excluding woody vines,
2. JURTIENTAD - Chelone glabra			FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
3. SEEDBOL - Understein alternifolia	_30_	×	FACW	
4. DER TONAUE - Dicanthelium clanderman			FAC	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
5. CHESENTTHE - Buehmeria cylindrica	_5	•	FACW	than 3 in. (7.6 cm) DBH.
6. SCILLAUS CYPERINUS			FACW	Shrub – Woody plants, excluding woody vines,
7. Typha Antonicolic			OBL	approximately 3 to 20 ft (1 to 6 m) in height.
8. Jupatiens capensis	5		FACW	Herb - All herbaceous (non-woody) plants, including
9. Carex 3pp.			FAC	herbaceous vines, regardless of size, and woody
10. Japanise stur cinass M. Vimineum	_5		M	plants, except woody vines, less than approximately
11. BIDENS Spp.			FAC	3 ft (1 m) in height.
12. SanSitue from - Onocles Sensibilis	2		FACW	Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size:)	_/[10	= Total Cov	ver	
1				
3				
4				Hydrophytic
5.				Vegetation Present? Yes <u>No</u>
		= Total Cov		Present? Yes <u>No</u>
Demoker (Include photo numbers here as a second of			vei	
Remarks: (Include photo numbers here or on a separate sh	ieet.)			

SOIL

~		.	
Sampl	ina	Point:	

SOIL								Sampling Point:
	cription: (Describe	to the dept				or confirm	n the absence of	indicators.)
Depth (inches)	<u>Matrix</u> Color (moist)		Redox Color (moist)	<u>< Features</u> %	Type ¹	Loc ²	Texture	Remarks
	an th		IDVE SKO	·····				Terrars
0-10	2.54 5/1		TOYR STR		Tem	1.	SILTY CLAY	
	£							
			,					
				·				
<u> </u>								
							2	
	oncentration, D=Depl	letion, RM=I	Reduced Matrix, MS	S=Masked	Sand Gra	ains.		Pore Lining, M=Matrix.
Hydric Soil			Dauly Courfs as	(07)				rs for Problematic Hydric Soils ³ :
Histosol	• •		Dark Surface Polyvalue Be		co (SR) (N) Muck (A10) (MLRA 147) st Prairie Redox (A16)
	pipedon (A2) istic (A3)		Thin Dark Su					ILRA 147, 148)
	en Sulfide (A4)		Loamy Gleye			(47, 140)		mont Floodplain Soils (F19)
	d Layers (A5)		Depleted Mat		,			ILRA 136, 147)
	uck (A10) (LRR N)		Redox Dark S		6)			Parent Material (TF2)
	d Below Dark Surface	e (A11)	Depleted Dar					Shallow Dark Surface (TF12)
	ark Surface (A12)		Redox Depre				Othe	er (Explain in Remarks)
ł	Mucky Mineral (S1) (L	.RR N,	Iron-Mangane		es (F12) (LRR N,		
1	A 147, 148)		MLRA 13 Umbric Surfa		MI DA 42	6 400	³ Indica	tors of hydrophytic vegetation and
Sandy C	Gleyed Matrix (S4)		Piedmont Flo		-			and hydrology must be present,
	d Matrix (S6)			ouplain o	0113 (1 10)			ss disturbed or problematic.
	Layer (if observed):							
1	• · · ·							
	ches):						Hydric Soil Pro	esent? Yes∽∕ No
Remarks:								
				1. 0				D
02	SERVED AN	ling ,	& MUCK	5 3	0125	Imp	PACIED 13	SY AMD
00		- (-) (, ·					€ .
l								
L								

DETLAND 15	W-MOT-101512-02
WETLAND DETERMINATION DATA FORM – Eastern	n Mountains and Piedmont
Project/Site: AEP B16 SANDY POND CLOSULE City/County: 10115,	a Louger coming Date 10/100/11
Applicant/Owner:	
Investigator(s): BAO, MOT Section, Township, Ran	nge:
Landform (hillslope, terrace, etc.): Tor or Scope Local relief (concave, conve	rex, none): <u>Converse</u> Slope (%):
Subregion (LRR or MLRA): Lat: Lat: Long	g: Datum:
,)	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No	
	Normal Circumstances" present? Yes No
Are vegetation, Soli, or Hydrology hattraily problematic? (If her	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS Attach site map showing sampling point lo	ocations, transects, important features, et
Hydrophytic Vegetation Present? Yes <u>X</u> No Is the Sampled	
Is the sampled	Area ud? Yes No
Wetland Hydrology Present? Yes No	
Remarks:	
REMARKS: REMARTLAND THAT IS CONNECTED TO DAM IMPACTED BY AMD	n out fair statement
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required
Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres on Living Roots	
Water Marks (B1)	Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C	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 <u>k</u> No <u>beth</u> (inches): <u>b</u>	
Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches):	
	tland Hydrology Present? Yes 🔀 No
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections)), if available:
Remarks:	
	•

W-MPT-101512.02

VEGETATION	(Five Strata) – Use scientific	names of nlants
VEGLIANON	(Inve Strata	j = 0.36 scienting	names or plants.

VEGETATION (Five Strata) – Use scientific na	mes of p	plants.		Sampling Point:
		Dominant		Dominance Test worksheet:
No.	% Cover	Species?	Status	Number of Dominant Species
1	<u></u>		Pi	That Are OBL, FACW, or FAC: (A)
3				Total Number of Dominant Species Across All Strata:(B)
4				Percent of Dominant Species
4				That Are OBL, FACW, or FAC: _/OO_ (A/B)
6				Prevalence Index worksheet:
		= Total Cov		Total % Cover of:Multiply by:
Sapling Stratum (Plot size:)				OBL species $1/0$ $x = 1/0$
1				FACW species 35 x 2 = 50 FAC species 5 x 3 = 15
2				FAC species x 3 = FACU species x 4 =
2. 3. 4. 5.	·			UPL species
5				Column Totals: 120 (A) 175 (B)
6				Prevalence Index = $B/A = 1.45$
7				Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)	;	= Total Cov	/er	1 - Rapid Test for Hydrophytic Vegetation
1				$\underline{\psi}$ 2 - Dominance Test is >50%
2	·			3 - Prevalence Index is ≤3.0 ¹
3	<u></u>			4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4				Problematic Hydrophytic Vegetation ¹ (Explain)
6				
7				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic,
Herb Stratum (Plot size:)	:	= Total Cov	/er	Definitions of Five Vegetation Strata:
1. TIPHA ANGUSTIFOLIA	90	~	OBL	Tree – Woody plants, excluding woody vines,
2. REDROOT FURTSEDANT - Cyperus Crythronhizos 3. Develos Cyperinus	20		FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
				Sapling – Woody plants, excluding woody vines,
4. NEEDER SPILETUSH - Fleocharis ocicularis 5. BIDENS Spp.		·	FAC	approximately 20 ft (6 m) or more in height and less
6				than 3 in. (7.6 cm) DBH.
7				Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
8				
9				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
10				plants, except woody vines, less than approximately 3 ft (1 m) in height.
11				Woody vine – All woody vines, regardless of height.
	-	= Total Cov	/er	woody vine – An woody vines, regardless of height.
Woody Vine Stratum (Plot size:)	•			
1				
2				
4.				Hydrophytic
5				Vegetation Present? Yes No
	:	= Total Cov	/er	
Remarks: (Include photo numbers here or on a separate sh	neet.)			1

SOIL.	Sampling Point:
Profile Description: (Describe to the depth needed to document the indicator or cont	firm the absence of indicators.)
Depth Matrix Redox Features	
(inches) Color (moist) % Color (moist) % Type ¹ Loc ²	Texture Remarks
KSEE BEROW × SOILS ASSUM	60 4
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
Histosol (A1) Dark Surface (S7)	2 cm Muck (A10) (MLRA 14 7)
Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 1	
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 14	
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)	Red Parent Material (TF2)
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)
Sandy Mucky Mineral (S1) (LRR N, Iron-Manganese Masses (F12) (LRR N,	,
MLRA 147, 148) MLRA 136)	
Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122)	
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA	A 148) wetland hydrology must be present,
Stripped Matrix (S6)	unless disturbed or problematic.
Restrictive Layer (if observed):	
Туре:	
Depth (inches):	Hydric Soil Present? Yes 📉 No

Remarks:

* SOILS ASSUMED HYDRIC AS THEY ARE & SEVERILY DISTURBED BY AMD & INUNDATED THE PRESENCE OF AMD Materials OVERLYING. UNSORTED ALLOWAL GRAVEZ & FRACTURED BEDROCK MATERIAL SOIL LAGES SIGNIFICANT OTTGANIC MATTER IN UPPERLAYERS. SOIL SATURATED AT SURFACE.

Applicant/Owner: <u>AEP</u> Investigator(s): <u>BAD</u> Landform (hillslope, terrace, et	1	LLOSURE City	/County: LOUISA.L	ALONENCE Sa	moling Date: 10/15
nvestigator(s): <u><u>BA</u>, andform (hillslope, terrace, el</u>					8
Landform (hillslope, terrace, et					
Subregion (LRR or MLRA):					
Soil Map Unit Name:S			V		
Are climatic / hydrologic condit		3			
Are Vegetation, Soil	,	1		al Circumstances" pres	ent?Yes <u>K</u> No
Are Vegetation, Soil	, or Hydrolog y	naturally problem	matic? (If needed,	explain any answers ir	n Remarks.)
SUMMARY OF FINDING	3S – Attach si	te map showing sa	mpling point locati	ons, transects, ir	nportant features, e
					•
Hydrophytic Vegetation Pres		<u> </u>	Is the Sampled Area		
Hydric Soil Present?		<u> No</u>	within a Wetland?	Yes	No
Wetland Hydrology Present? Remarks:		No			
			j.		
PEM/PSS WETT DISTURBED A					"
HYDROLOGY					
Wetland Hydrology Indicate	ors:			Secondary Indicators	s (minimum of two required
Primary Indicators (minimum	of one is required;	check all that apply)		Surface Soil Cra	icks (B6)
Surface Water (A1)		True Aquatic Plants		Sparsely Vegeta	ited Concave Surface (B8)
High Water Table (A2)		Hydrogen Sulfide C		Crainage Patter	
Saturation (A3)			eres on Living Roots (C3)		
 Water Marks (B1) Sediment Deposits (B2) 		Presence of Reduc		Dry-Season Wat Crayfish Burrow	
Drift Deposits (B3)		Thin Muck Surface			e on Aerial Imagery (C9)
Algal Mat or Crust (B4)		Other (Explain in R		Stunted or Stres	U J ()
Iron Deposits (B5)				Geomorphic Pos	sition (D2)
Inundation Visible on Ae				Shallow Aquitare	
Water-Stained Leaves (I	39)			Microtopographi	
Aquatic Fauna (B13)				FAC-Neutral Te	st (D5)
Field Observations:	Vee Ne)4 Donth (inches)			
Surface Water Present? Water Table Present?		∠ Depth (inches): ✓ Depth (inches):			
Saturation Present?		Depth (inches):		Hydrology Present?	Yes 📈 No 🔜
(includes capillary fringe)			previous inspections), if av		

W- MOT- 101512 - 03

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

Sampling Point: ____

	Absolute			Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata:(B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: (A/B)
6		<u> </u>		
7				Prevalence Index worksheet:
		= Total Cov	/er	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:)			.	OBL species _//0 x 1 = _//0
1. SALIX MIGRA		<u> </u>	OBL	FACW species (45) x 2 = 130
2. FRASINUS OCCURENTALIS	25	$\underline{\times}$	<u>PMCIO</u>	FAC species 20 x 3 = 40
3				FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: 195 (A) 300 (B)
6			<u> </u>	
7				Prevalence Index = $B/A = 1.54$
·····		= Total Cov		Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)				1 - Rapid Test for Hydrophytic Vegetation
1				∠ 2 - Dominance Test is >50%
2	· · · · · · · · · · · · · · · · · · ·			≤ 3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptations ¹ (Provide supporting
				data in Remarks or on a separate sheet)
4 5				Problematic Hydrophytic Vegetation ¹ (Explain)
<u>.</u>				
6				¹ Indicators of hydric soil and wetland hydrology must
/·				be present, unless disturbed or problematic.
Herb Stratum (Plot size:)		= Total Co	/er	Definitions of Five Vegetation Strata:
1. Typha latifolia	âo		DBL	Tree – Woody plants, excluding woody vines,
2. VUNCUS effusus			FACW	approximately 20 ft (6 m) or more in height and 3 in.
3. Carle Vulpmondea			77	(7.6 cm) or larger in diameter at breast height (DBH).
4. TURTIE HEAD - Chelone glabia			GBL	Sapling – Woody plants, excluding woody vines,
5. SEEDBOX - LUDWIGIA Atternitolia		~	FACW	approximately 20 ft (6 m) or more in height and less
			FAR	than 3 in. (7.6 cm) DBH.
6. Solipatio spp.				Shrub – Woody plants, excluding woody vines,
7				approximately 3 to 20 ft (1 to 6 m) in height.
8				Herb – All herbaceous (non-woody) plants, including
9				herbaceous vines, regardless of size, and woody
10				plants, except woody vines, less than approximately
11		·		3 ft (1 m) in height.
12				Woody vine - All woody vines, regardless of height.
	150	= Total Co	ver	
Woody Vine Stratum (Plot size:)				
1				
2				
3				the description of a
4		·		Hydrophytic Vegetation
5	····			Present? Yes <u>No</u> No
		= Total Co	ver	
Remarks: (Include photo numbers here or on a separate	e sheet.)			
	,			

000

C	-11	Detete	
Sam	piniq	Point:	

.

SOIL								Sampling	Point:
Profile Desc	cription: (Describe	to the de	pth needed to docu	ment the i	ndicator	or confir	m the absence o	of indicators.)	
Depth	Matrix		Redo	x Feature	s				
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type ¹	_Loc ²			narks
0-10	10 V12 5/1	<u></u>	101112 5/6	<u>ar</u>	em	_M_	SUTYCHAY.	GRAVEZ	OBSERVED
	• •		*				<i>r</i> (
			• ••••••••••••••••••••••••••••••••••••						
						• _			······································
						·	·		······································
			- <u></u>			,- <u></u> ,			
	<u>.</u>	- <u>-</u>	• ····			·			
					·				
				- <u>-</u>		·····			·····
		letion, RM	I=Reduced Matrix, M	S=Masked	d Sand Gr	ains.		=Pore Lining, M=N	
Hydric Soil	Indicators:						Indicat	ors for Problema	itic Hydric Soils ³ :
Histosol	• •		Dark Surface					m Muck (A10) (M	'
	pipedon (A2)		Polyvalue Be					ast Prairie Redox	(A16)
Black Hi			Thin Dark Si			147, 148)		(MLRA 147, 148)	0 1 (5 (0)
/ — · ·	en Sulfide (A4) d Layers (A5)		Loamy Gley Depleted Ma		(FZ)			edmont Floodplain (MLRA 136, 147)	Solis (F19)
	uck (A10) (LRR N)		Redox Dark		-6)			d Parent Material	(TE2)
	d Below Dark Surfac	e (A11)	Depleted Da	•	,			ry Shallow Dark S	
	ark Surface (A12)	- (- · · ·)	Redox Depr		• •			her (Explain in Re	
	/ucky Mineral (S1) (I	LRR N,	Iron-Mangar		•	LRR N,			· · · · · ·
	A 147, 148)		MLRA 13						
Sandy G	Gleyed Matrix (S4)		Umbric Surfa		•			ators of hydrophy	tic vegetation and
Sandy R	Redox (S5)		Piedmont Fl	oodplain S	Soils (F19)	(MLRA 1	1 48) we	atland h y drology m	iust be present,
	I Matrix (S6)						un	less disturbed or p	problematic.
Restrictive	Layer (if observed):	:							
Type:									10
Depth (in	ches):						Hydric Soil I	Present? Yes _	No
Remarks:									

WETLAND 17

WETLAND DETERMINATION DATA FORM	<i>W - MDT- ⊺ ما≲ا</i> – Eastern Mountains and Piedmont Region
	County: LOVISA, UMUNCAICE Sampling Date: 15, OCT. 2012
Applicant/Owner: <u>AEP</u>	
Investigator(s): <u>B. • TTD</u> , <u>M. THO WHYFYR</u> , <u>UKS</u> Secti	State: Ky Sampling Point:
Landform (hillslope, terrace, etc.):FLOOD_PL4/NJ Local re	
Subregion (LRR or MLRA): Lat:	
Soil Map Unit Name:GF	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year?	
Are Vegetation, Soil, or Hydrology significantly distu	
Are Vegetation, Soil, or Hydrology naturally problem	atic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sar	npling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No Remarks: Yes No	Is the Sampled Area within a Wetland? YesX No
PFO WETLAND LOCATED ALONG STRE	Am H WITHIN A STREAM VALLEY.
SOILS WERE NOTED AS WITH A SHNDY LOAM	(.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants	
High Water Table (A2) Hydrogen Sulfide Oc	
Saturation (A3) Oxidized Rhizosphere Water Marks (B1) Presence of Reduce	es on Living Roots (C3) Moss Trim Lines (B16) d Iron (C4) Dry-Season Water Table (C2)
	on in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface (
Algal Mat or Crust (B4) Other (Explain in Re	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
X Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	K FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No K Depth (inches):	
Water Table Present? Yes No C Depth (inches):	
Saturation Present? Yes <u>No</u> Depth (inches): So (includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring weil, achai photos, pr	
Remarks:	
WETLAND IS LOCATED ABUTTING	TREAM H.

WETLAND 17

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-MDT- 101512-04

SCover	Dominant Species?	Indicator	Dominance Test worksheet:
25		Statue	
		FACW	Number of Dominant Species
	<u> </u>		That Are OBL, FACW, or FAC: (A)
15		FACE	Total Number of Dominant
<u>40</u>	$\underline{\times}$	(-ACW	Species Across All Strata: (B)
5		FACW	
5		FACW	Percent of Dominant Species (A/B) That Are OBL, FACW, or FAC: (A/B)
5		OBL	
	·		Prevalence Index worksheet:
			Total % Cover of: Multiply by:
01	<u> </u>		OBL species x1 = 5
=	Total Cove	er	FACW species $210 \times 2 = 420$
	. /	<u></u>	FAC species \underline{UT} x3 = $ 4 $
			FACU species x 4 =
		. <u> </u>	UPL species x 5 =
			Column Totals: 202 (A) 506 (B)
			Prevalence Index = $B/A = 2.16$
			Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation
			∠ 2 - Dominance Test is >50%
			$\underline{\times}$ 3 - Prevalence Index is $\leq 3.0^{1}$
20 =	Total Cove	er	4 - Morphological Adaptations ¹ (Provide supporting
			data in Remarks or on a separate sheet)
70	×	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
40	$\overline{\mathbf{v}}$		
			¹ Indicators of hydric soil and wetland hydrology must
	<u> </u>		be present, unless disturbed or problematic.
			Definitions of Four Vegetation Strata:
	. <u> </u>		
			Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
2	<u> </u>	FAC	more in diameter at breast height (DBH), regardless of height.
		FAC	l neight.
			Sapling/Shrub Woody plants, excluding vines, less
			than 3 in. DBH and greater than or equal to 3.28 ft (1
			m) tall.
			Herb – All herbaceous (non-woody) plants, regardless
14		<u> </u>	of size, and woody plants less than 3.28 ft tall.
<u>4†</u> =	 Total Cove 	er	
			Woody vine - All woody vines greater than 3.28 ft in
			height.
			Hydrophytic
	. <u> </u>		Vegetation
		. <u> </u>	Present? Yes No
=	Total Cove	er	
	95 = 20 	$20 \times \\$	$\frac{95}{20} = Total Cover$ $\frac{20}{20} \times FAC$ $\frac{20}{20} \times FAC$ $\frac{20}{20} \times FAC$ $\frac{20}{20} = Total Cover$ $\frac{10}{20} \times FACU$

METLAND 17-

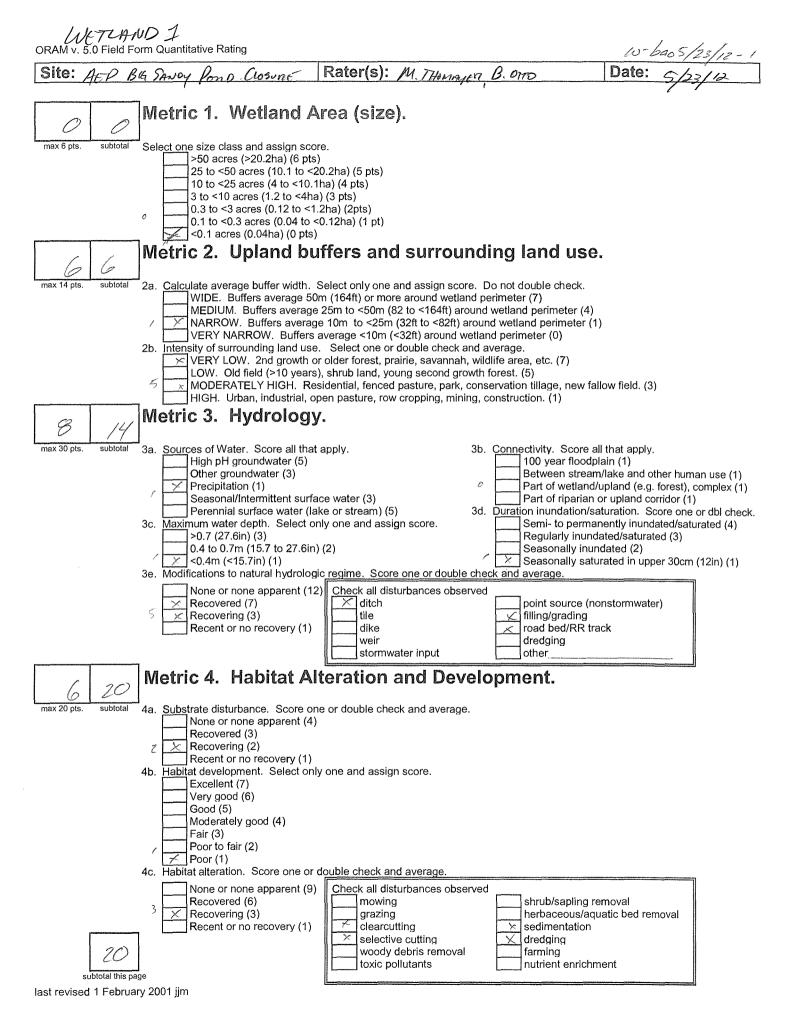
				Sampling Point: 2- MOT-101
pth needed to docu	ment the indicat	or or confir	m the absence	of indicators.)
Color (moist)	~			Remarks
10 VR 4/6			_ SANDY L	-04m
10 / p. 4/6	20 R	<u>n</u>	SANDY	LOAM
I=Reduced Matrix, M	S=Masked Sand	Grains.		L=Pore Lining, M=Matrix.
				ators for Problematic Hydric Soils ³ :
 Polyvalue Be Thin Dark Su Loamy Gleye Depleted Ma Redox Dark Depleted Da Redox Depreted Da Iron-Mangar 	elow Surface (S8) Irface (S9) (MLR ed Matrix (F2) Itrix (F3) Surface (F6) rk Surface (F7) essions (F8) Iese Masses (F1)	A 147, 148)	', 148) C F \	2 cm Muck (A10) (MLRA 14 7) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19) (MLRA 136, 147) /ery Shallow Dark Surface (TF12) Other (Explain in Remarks)
		136 122)	³ inc	licators of hydrophytic vegetation and
				etland hydrology must be present,
			-	less disturbed or problematic.
			1	· · · · · · · · · · · · · · · · · · ·
			Hydric Soi	Present? Yes <u>X</u> No
X		<u>.,</u>		
	A=Reduced Matrix, M Dark Surface Polyvalue Be Thin Dark Su Depleted Ma Redox Dark Depleted Da Redox Dark Depleted Da Redox Dark Depleted Da Redox Dark Depleted Da Redox Dark Depleted Da Redox Dark Depleted Da Redox Depre Iron-Mangan MLRA 13 Umbric Surface Piedmont Fid	Redox Features Color (moist) % Type Io I/II 30 I/II Io I/II 4/II 30 I/II Io I/II 4/II 30 I/II Io I/II 4/II 30 I/II Io Ion Ion Ion Ion Ion Ion Ion Ion Ion I	Redox Features Color (moist) % Type1 Loc2 Io I/A 4/6 30 Im Im Io I/A 4/16 30 Im Im Io I	Color (moist) % Type1 Loc2 Texture IO I/IL 30 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 I/IL M SA M by / ID I/IL 20 IIL M SA M by / ID I/IL 20 IIL IIL IIL IIL ID I/IL 20 IIL IIL IIL IIL IIL ID Indic Indic IIL IIL



APPENDIX B

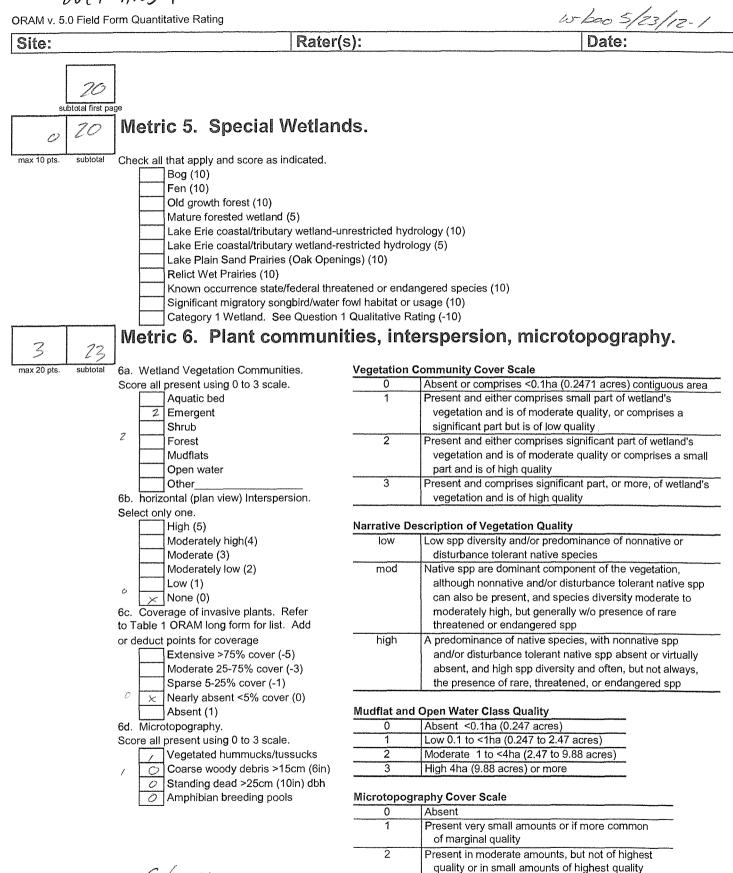
OHIO EPA WETLAND ORAM FORMS





METCAND

ORAM v. 5.0 Field Form Quantitative Rating



Category

End of Quantitative Rating. Complete Categorization Worksheets.

3

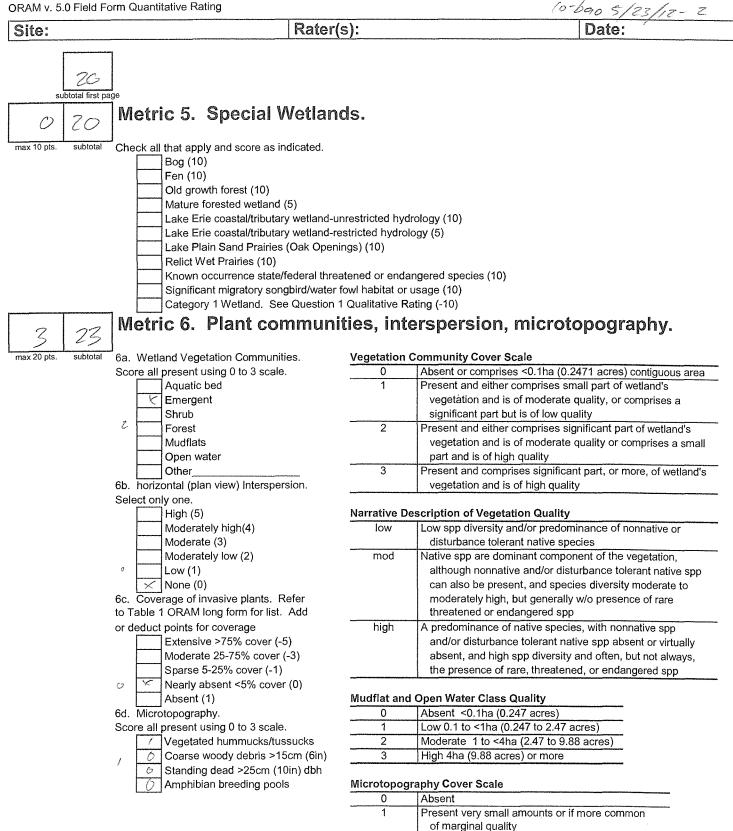
Present in moderate or greater amounts

WETLAND2 1. 5.0 Field Form Quantitative Rating

W-bao 5/23/12-Date: 23, MAY 20 ORAM v. AEP BIG SANDY POND CLOSURE Rater(s): M.THOMMYER, B. OTTO Site: Uns Metric 1. Wetland Area (size). max 6 pts. subtotal Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) (5 pts) 10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts) 0.3 to <3 acres (0.12 to <1.2ha) (2pts) b 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt) <0.1 acres (0.04ha) (0 pts) Metric 2. Upland buffers and surrounding land use. (o10 2a. Calculate average buffer width. Select only one and assign score. Do not double check. max 14 pts. subtotal WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4) NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) X VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) Intensity of surrounding land use. Select one or double check and average. 2b. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5) 5 MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3) HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1) Metric 3. Hydrology. ${\mathcal B}$ Sources of Water. Score all that apply. max 30 pts subtotal 3b. Connectivity. Score all that apply. 3a. High pH groundwater (5) 100 year floodplain (1) Other groundwater (3) Between stream/lake and other human use (1) 11 Part of wetland/upland (e.g. forest), complex (1) Precipitation (1) Seasonal/Intermittent surface water (3) Part of riparian or upland corridor (1) Perennial surface water (lake or stream) (5) 3d. Duration inundation/saturation. Score one or dbl check. Semi- to permanently inundated/saturated (4) Maximum water depth. Select only one and assign score. 3c. >0.7 (27.6in) (3) Regularly inundated/saturated (3) 0.4 to 0.7m (15.7 to 27.6in) (2) Seasonally inundated (2) <0.4m (<15.7in) (1) Seasonally saturated in upper 30cm (12in) (1) x Modifications to natural hydrologic regime. Score one or double check and average. 3e. None or none apparent (12) Check all disturbances observed Recovered (7) X ditch point source (nonstormwater) 2 Recovering (3) tile filling/grading Recent or no recovery (1) dike road bed/RR track dredging weir stormwater input other Metric 4. Habitat Alteration and Development. 20 6 subtotal 4a, Substrate disturbance. Score one or double check and average. max 20 pts None or none apparent (4) Recovered (3) Z X Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only one and assign score. Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) 4c. Habitat alteration. Score one or double check and average Check all disturbances observed None or none apparent (9) shrub/sapling removal Recovered (6) mowing 3 Recovering (3) arazina herbaceous/aquatic bed removal Recent or no recovery (1) \checkmark clearcutting sedimentation selective cutting dredging woody debris removal farming toxic pollutants nutrient enrichment subtotal this page last revised 1 February 2001 jjm

WETLANDQ

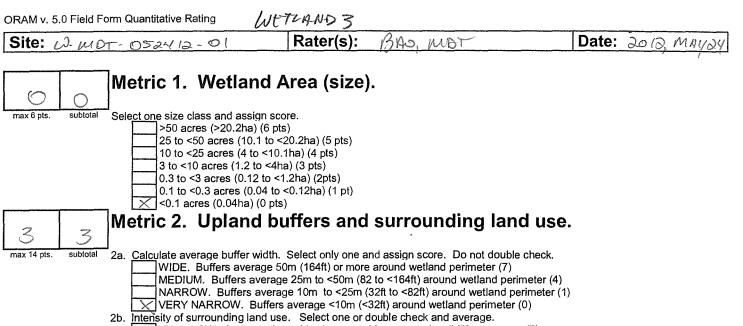
ORAM v. 5.0 Field Form Quantitative Rating

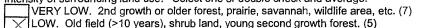


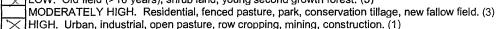
2 Present in moderate amounts, but not of highest quality or in small amounts of highest quality 3 Present in moderate or greater amounts and of highest quality

End of Quantitative Rating. Complete Categorization Worksheets.

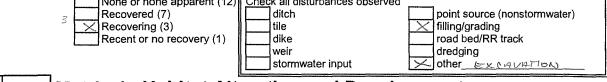
Gategory



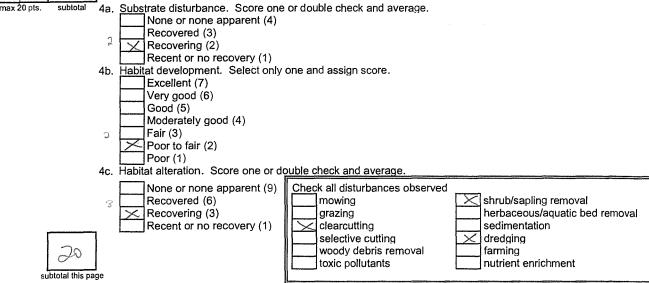




max 30 pts. subtotal Sources of Water. Score all that apply. 3b. Connectivity. Score all that apply. 3a. High pH groundwater (5) 100 year floodplain (1) Other groundwater (3) Between stream/lake and other human use (1) 4 Part of wetland/upland (e.g. forest), complex (1) Precipitation (1) Seasonal/Intermittent surface water (3) Part of riparian or upland corridor (1) 3d. Duration inundation/saturation. Score one or dbl check. Perennial surface water (lake or stream) (5) 3c. Maximum water depth. Select only one and assign score. Semi- to permanently inundated/saturated (4) Regularly inundated/saturated (3) >0.7 (27.6in) (3) 6 0.4 to 0.7m (15.7 to 27.6in) (2) Seasonally inundated (2) <0.4m (<15.7in) (1) Seasonally saturated in upper 30cm (12in) (1) 3e. Modifications to natural hydrologic regime. Score one or double check and average. None or none apparent (12) Check all disturbances observed







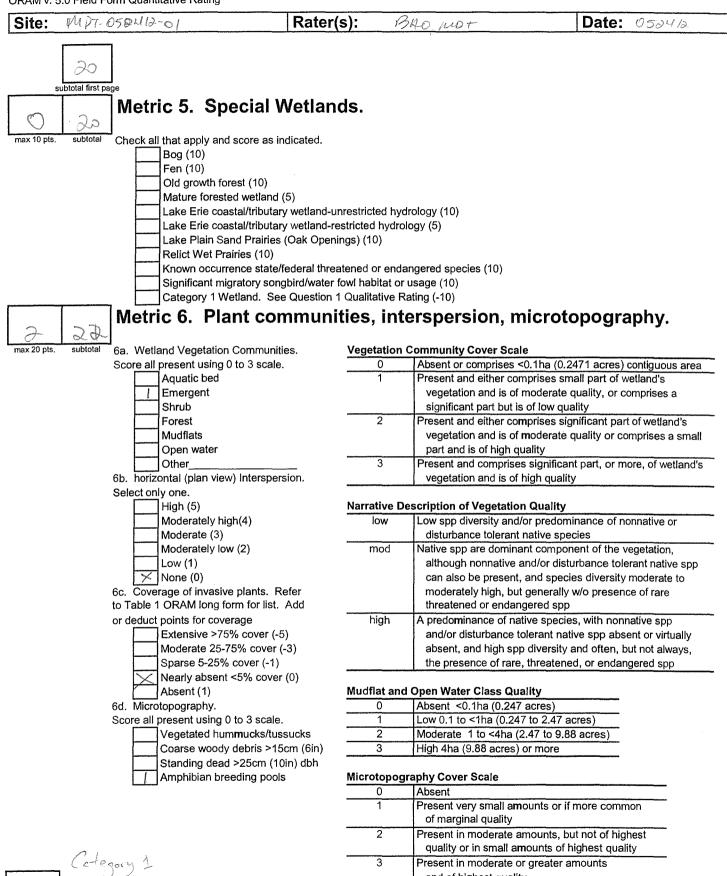
last revised 1 February 2001 jjm

20

3

Metric 3. Hydrology.

WETLAND 3



End of Quantitative Rating. Complete Categorization Worksheets.

3

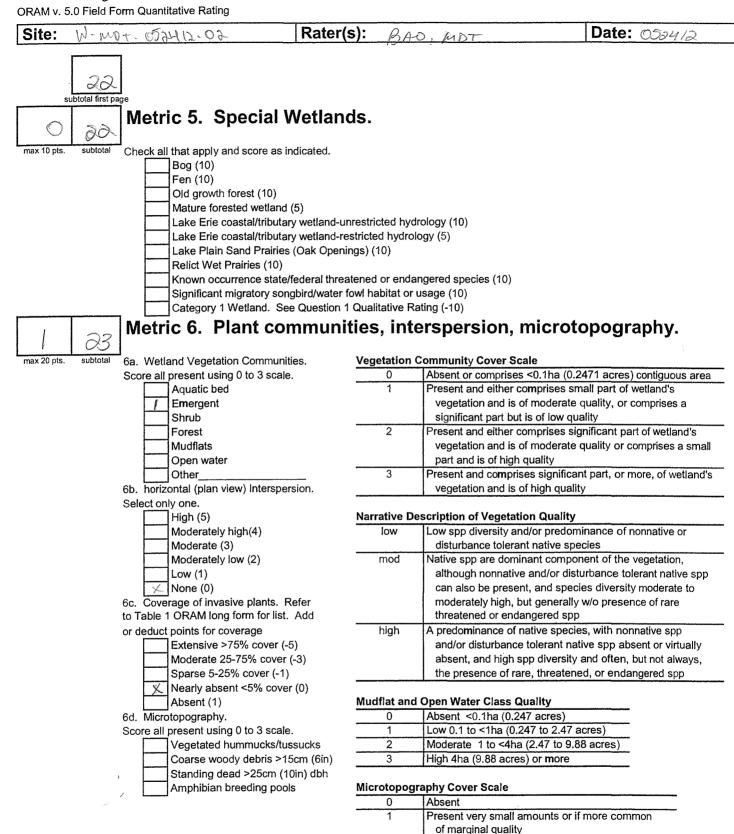
Present in moderate or greater amounts

WETLANDH ORAM v. 5.0 Field Form Quantitative Rating Rater(s): BAO. Date: 0524/2 Site: W-MDT- 052412-02 HOT-Metric 1. Wetland Area (size). Select one size class and assign score. subtotal max 6 pts >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) (5 pts) 10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts) 0.3 to <3 acres (0.12 to <1.2ha) (2pts) 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)</p> <0.1 acres (0.04ha) (0 pts) Metric 2. Upland buffers and surrounding land use. L 2 2a. Calculate average buffer width. Select only one and assign score. Do not double check. max 14 pts subtotal WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4) NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) Intensity of surrounding land use. Select one or double check and average. 2b. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) 3 LOW. Old field (>10 years), shrub land, young second growth forest. (5) MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3) HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1) Metric 3. Hydrology.

3a. Sources of Water. Score all that apply. max 30 pts. subtotal 3b. Connectivity. Score all that apply. 100 year floodplain (1) High pH groundwater (5) Between stream/lake and other human use (1) Other groundwater (3) 4 Precipitation (1) Part of wetland/upland (e.g. forest), complex (1) Seasonal/Intermittent surface water (3) Part of riparian or upland corridor (1) Perennial surface water (lake or stream) (5) 3d. Duration inundation/saturation. Score one or dbl check. Maximum water depth. Select only one and assign score. 3c. Semi- to permanently inundated/saturated (4) >0.7 (27.6in) (3) Regularly inundated/saturated (3) - Sp. moss З 0.4 to 0.7m (15.7 to 27.6in) (2) Seasonally inundated (2) ł <0.4m (<15.7in) (1) Seasonally saturated in upper 30cm (12in) (1) 3e. Modifications to natural hydrologic regime. Score one or double check and average. None or none apparent (12) Check all disturbances observed 3 Recovered (7) ditch point source (nonstormwater) filling/grading Recovering (3) tile dike road bed/RR track Recent or no recovery (1) weir dredging stormwater input other ExCAVATION Metric 4. Habitat Alteration and Development. 20 subtotal max 20 pts 4a. Substrate disturbance. Score one or double check and average. None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) Habitat development. Select only one and assign score. 4b. Excellent (7)

Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) 4c. Habitat alteration. Score one or double check and average None or none apparent (9) Check all disturbances observed mowing shrub/sapling removal Recovered (6) Recovering (3) grazing herbaceous/aquatic bed removal clearcutting sedimentation Recent or no recovery (1) selective cutting dredaina woody debris removal farming dà toxic pollutants nutrient enrichment subtotal this page last revised 1 February 2001 jjm

WETZAND H



23 Catagory 1 End of Quantitative Rating. Complete Categorization Worksheets.

2

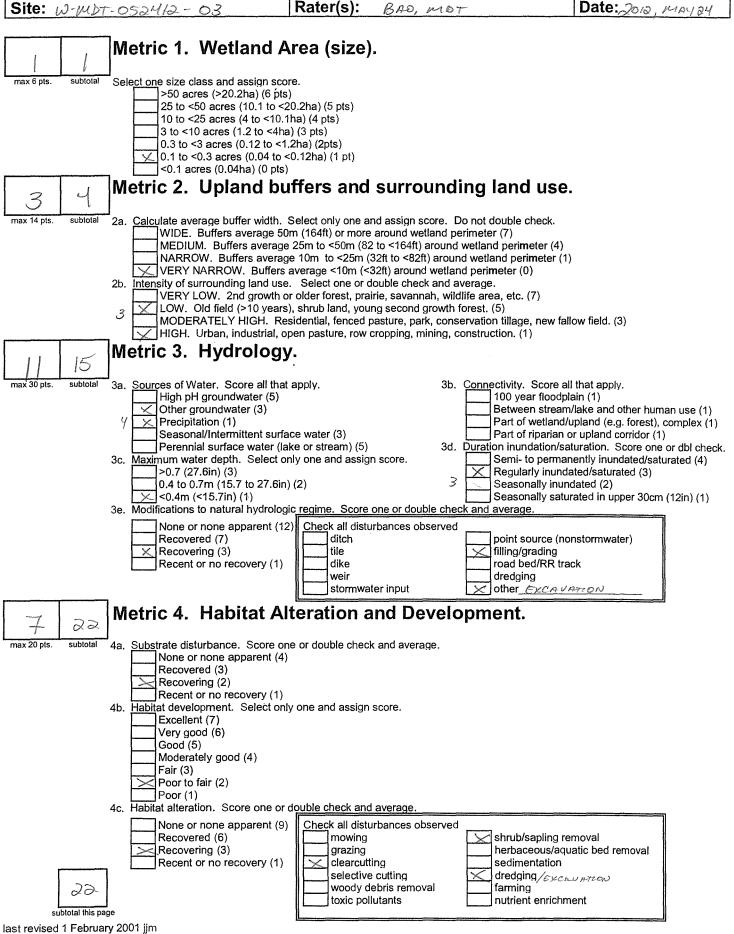
3

Present in moderate amounts, but not of highest

quality or in small amounts of highest quality

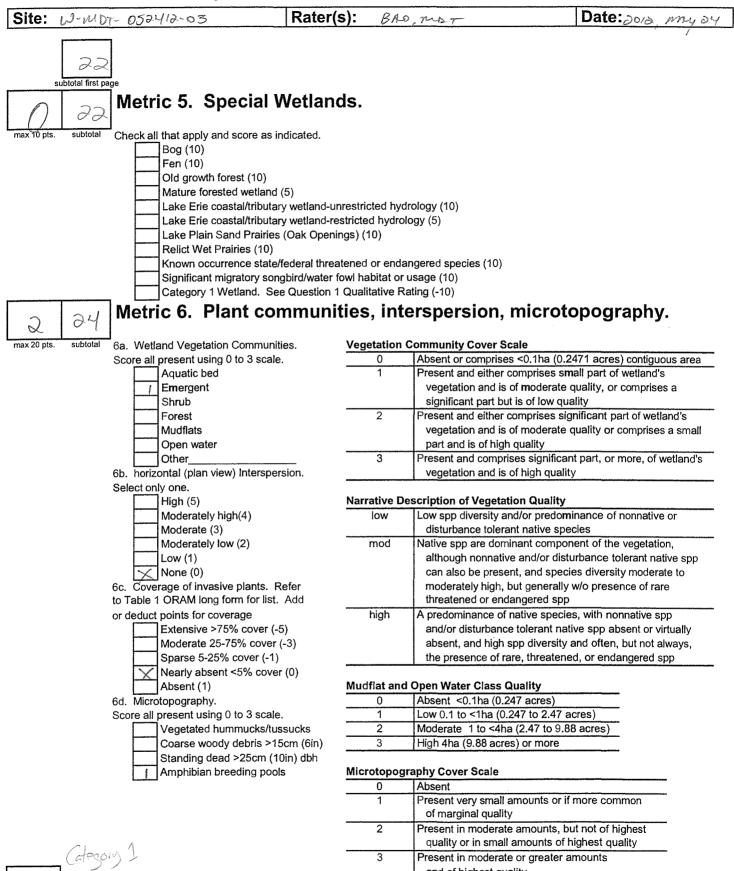
Present in moderate or greater amounts

Site: W-MDT-052412-03



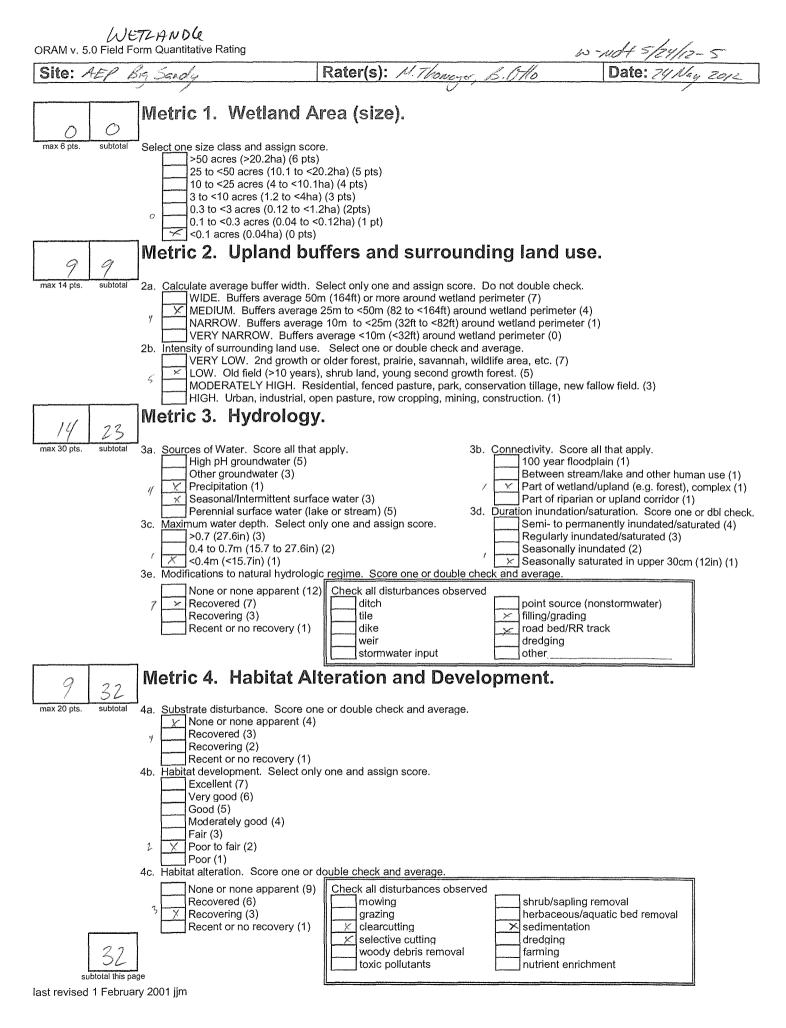
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INETLANDS



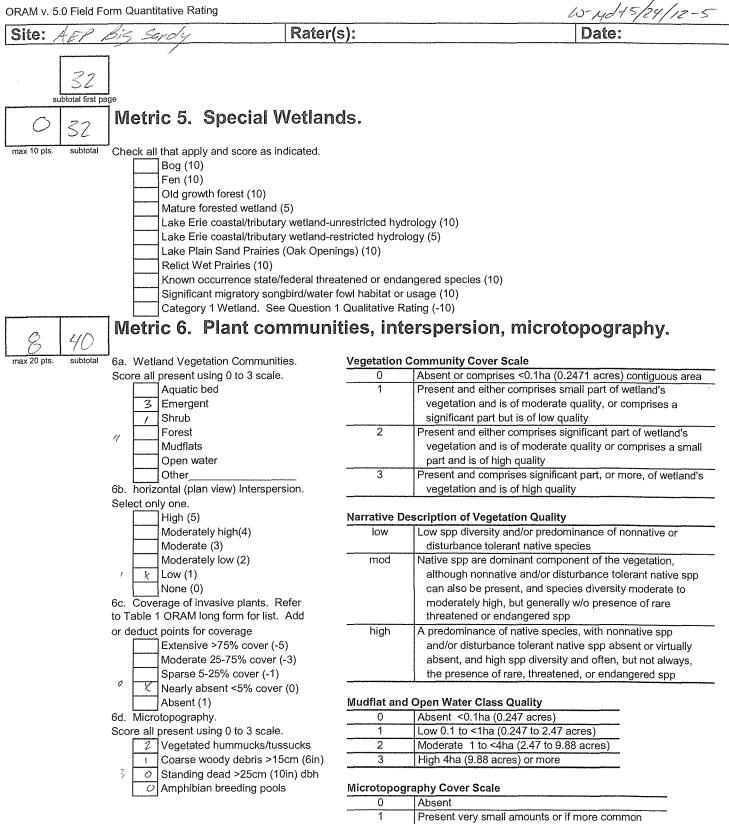
End of Quantitative Rating. Complete Categorization Worksheets.

and of highest quality



INETLAND 6

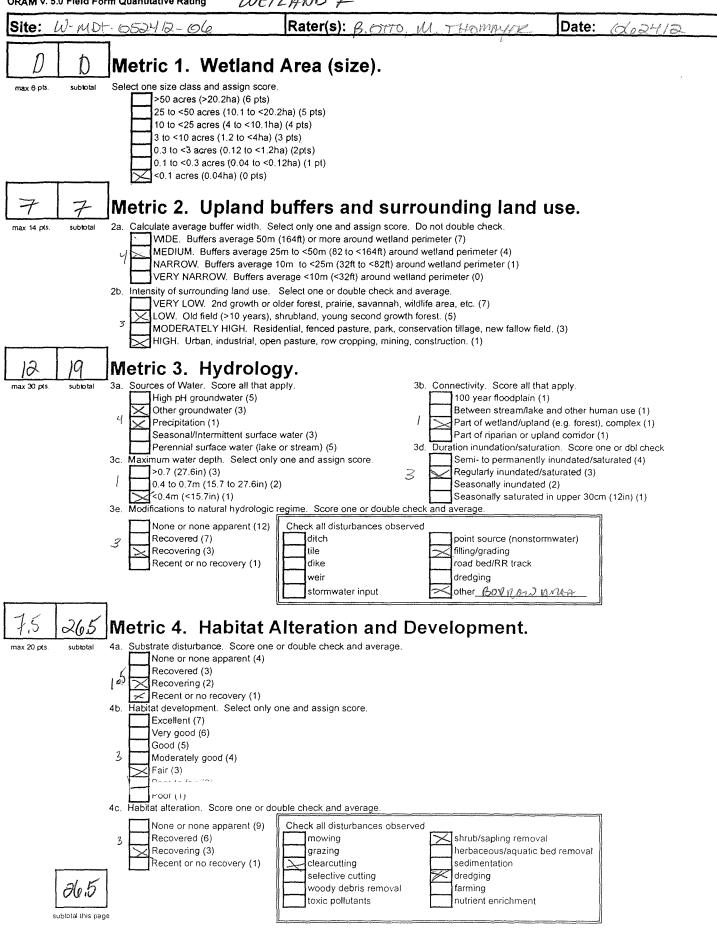




of marginal quality 2 Present in moderate amounts, but not of highest quality or in small amounts of highest quality 3 Present in moderate or greater amounts and of highest quality

End of Quantitative Rating. Complete Categorization Worksheets.

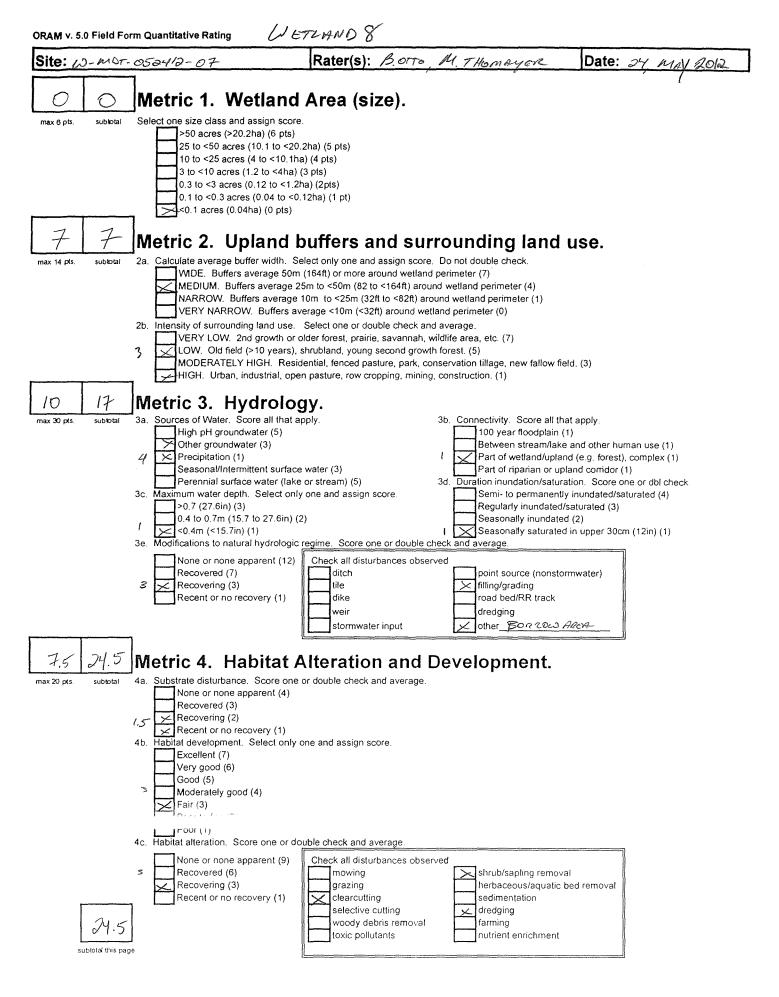
Category 2



te: W-MDI	-052412-06	Rater(s): B, 07	TD, M. Atomayer	Date: 24, MAY 2
<u> </u>	7			(
26.5				
Ľ.				
sublotal this p	age			
n 2400				
0 24.5	Metric 5. Specia	ai wetiands.		
10 pts. subtotal	Check all that apply and score as	indicated.		
	Bog (10)			
	Fen (10)			
	Old growth forest (10)			
	Mature forested wetland		(10)	
		ary wetland-unrestricted hydrolog		
	Lake Plain Sand Prairie	ary wetland-restricted hydrology	(5)	
	Relict Wet Praires (10)	es (Oak Openings) (10)		
		e/federal threatened or endanger	red species (10)	
		ongbird/water fowl habitat or usag		
		ee Question 1 Qualitative Rating		
2 28.5	Metric 6. Plant	communities. in	nterspersion, mid	crotopography.
20 pts subtotal	 6a. Wetland Vegetation Commun 		•	
	Score all present using 0 to 3 scal	·····		0.2471 acres) contiguous area
	Aquatic bed	1	Present and either comprises	small part of wetland's
	2 Emergent		vegetation and is of modera	ite quality, or comprises a
	2 Shrub		significant part but is of low	quality
	Forest	2	Present and either comprises	• •
	Mudflats		-	ite quality or comprises a small
	Open water		part and is of high quality	
	Other	3		cant part, or more, of wetland's
	6b. horizontal (plan view) Interspective Select only one.		vegetation and is of high qu	anty
	High (5)	Narrative Descrip	tion of Vegetation Quality	
	Moderately high(4)	low	Low spp diversity and/or pred	ominance of nonnative or
	Moderate (3)		disturbance tolerant native	
	Moderately low (2)	mod	Native spp are dominant com	
	Low (1)		although nonnative and/or c	fisturbance tolerant native spp
	None (0)		can also be present, and sp	ecies diversity moderate to
	6c. Coverage of invasive plants.	Refer	moderately high, but genera	allyw/o presence of rare
	to Table 1 ORAM long form for lis		threatened or endangered s	
	or deduct points for coverage	high	A predominance of native spe	
	Extensive >75% cover (native spp absent or virtually
	-\ Moderate 25-75% cover -\ Sparse 5-25% cover (-1	• •	the presence of rare, threat	ity and often, but not always,
	Nearly absent <5% cov		The presence of fare, fined	ened, or enoungered app
	Absent (1)		Water Class Quality	
	6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
	Score all present using 0 to 3 sca	ile. <u>1</u>	Low 0.1 to <1ha (0.247 to 2.4	
	Vegetated hummucks/tu		Moderate 1 to <4ha (2.47 to	
		15cm (6in) 3	High 4ha (9.88 acres) or more	8
	Coarse woody debris >			
	[°]			
	Coarse woody debris >	, ,	Cover Scale	
	Coarse woody debris > Standing dead >25cm (Microtonography		
	Coarse woody debris > Standing dead >25cm (ole Microtonouranhy	Present very small amounts of	or if more common
	Coarse woody debris > Standing dead >25cm (ole Microtopography <u> </u>	Absent Present very small amounts of of marginal quality	
	Coarse woody debris > Standing dead >25cm (Microtonography	Present very small amounts of marginal quality Present in moderate amounts	s, but not of highest
C	Coarse woody debris > Standing dead >25cm (ole Microtopography <u> </u>	Absent Present very small amounts of of marginal quality	s, but not of highest of highest quality

28.5 GRAND TOTAL(max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between welland categories at the following address: http://www.epa.state.oh.us/dswl401/401.html



ر المر ORAM v. 5.0 Field Form Quantitative Rating	ETCAND 8	
Site: W-MOT-052412-07	Rater(s): B. OTTO, M. THOMAYER	Date: 24, MAY 2012
241.5 sublotal this page		,
Metric 5. Special	Wetlands.	
Lake Erie coastal/tributary Lake Plain Sand Prairies (0 Relict Wet Praires (10) Known occurrence state/fe Significant migratory songb Category 1 Wetland. See	i) wetland-unrestricted hydrology (10) wetland-restricted hydrology (5)	nicrotopography.
max 20 pts subtotal 6a. Wetland Vegetation Communitie	· · · ·	nererepegraphy.
Score all present using 0 to 3 scale.		ha (0.2471 acres) contiguous area
Aquatic bed		ises small part of wetland's
→ Emergent	1	derate quality, or comprises a
2 Shrub	significant part but is of	low quality
Forest	2 Present and either compr	ises significant part of wetland's
Mudflats	vegetation and is of mo	derate quality or comprises a small
Open water	part and is of high quali	ty
Other	3 Present and comprises si	gnificant part, or more, of wetland's
6b. horizontal (plan view) Interspersi	ion. vegetation and is of hig	h quality

Select only one. High (5)

0

I

Moderately high(4) Moderate (3)

Moderately low (2) Low (1) × None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add

> Extensive >75% cover (-5) Moderate 25-75% cover (-3)

> Sparse 5-25% cover (-1) Nearly absent <5% cover (0)

nandrina hanadira rauta

or deduct points for coverage

× Absent (1)

Score all present using 0 to 3 scale.

6d. Microtopography.

Narrative Description of Vegetation Quality

and a second	ion of vegetation adamy	
low	Low spp diversity and/or predominance of nonnative or	
	disturbance tolerant native species	
mod	Native spp are dominant component of the vegetation,	
	although nonnative and/or disturbance tolerant native spp	
	can also be present, and species diversity moderate to	
	moderately high, but generallyw/o presence of rare	
	threatened or endangered spp	
high	A predominance of native species, with nonnative spp	
	and/or disturbance tolerant native spp absent or virtually	
	absent, and high spp diversity and often, but not always,	
	the presence of rare, threatened, or endangered spp	

Mudflat and Open Water Class Quality

1, 1960 (11)	madnatation officer adams			
rotopography.	0	Absent <0.1ha (0.247 acres)		
I present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)		
Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)		
Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more		
Standing dead >25cm (10in) dbh				

+Floratononinghis Course Conta

0	Absent
1	Present very small amounts or if more common
	of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts
	and of highest quality

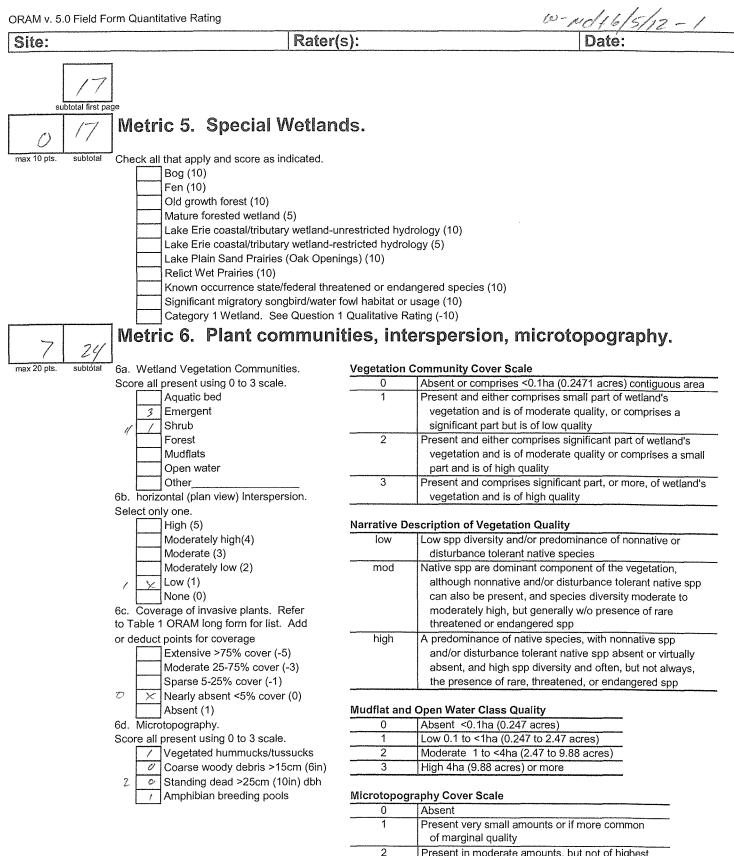
GRAND TOTAL(max 100 pts) 27.5

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between welland categories at the following address http://www.epa.state.oh.us/dsw/401/401.html

ORAM V. 5.0 Field Form Quantitative Rating

ORAM v. 5.	0 Field F	WETLAND 9 orm Quantitative Rating		6	w-will 15 laward
Site: /	41=P	BIGSANDY	Rater(s): M.THommyer	BOTTO	W-NOH6/5/2012-1 Date: 06/05/12
0	0	Metric 1. Wetland A			
max 6 pts.	subtotal	Select one size class and assign sco >50 acres (>20.2ha) (6 pts 25 to <50 acres (10.1 to < 10 to <25 acres (4 to <10. 3 to <10 acres (1.2 to <4h 0.3 to <3 acres (0.12 to << 0.1 to <0.3 acres (0.04 to <0.1 acres (0.04ha) (0 pts	s) 20.2ha) (5 pts) 1ha) (4 pts) a) (3 pts) I.2ha) (2pts) <0.12ha) (1 pt))		
3	3	Metric 2. Upland bu	uffers and surrounding	g land use	ý.
max 14 pts.	subtotal	WIDE. Buffers average 50 MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers 2b. Intensity of surrounding land use VERY LOW. 2nd growth LOW. Old field (>10 years MODERATELY HIGH. Re HIGH. Urban, industrial, of	Select only one and assign score. Do no Om (164ft) or more around wetland perime e 25m to <50m (82 to <164ft) around wet ge 10m to <25m (32ft to <82ft) around we average <10m (<32ft) around wetland pe e. Select one or double check and avera or older forest, prairie, savannah, wildlife s), shrub land, young second growth fores esidential, fenced pasture, park, conserva- open pasture, row cropping, mining, const	eter (7) land perimeter (4) etland perimeter (erimeter (0) ige. area, etc. (7) st. (5) tion tillage, new fa	1)
8	11	Metric 3. Hydrolog	у.		
max 30 pts.	subtotal	3a. Sources of Water. Score all that High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surf Perennial surface water (1) 3c. Maximum water depth. Select of >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6ir <	ace water (3) ake or stream) (5) 3d. Dur only one and assign score. a) (2) gic regime. Score one or double check and 2) Check all disturbances observed ditch tile	Part of wetland Part of riparian ation inundation/s Semi- to perma Regularly inun Seasonally inu Seasonally sat nd average.	plain (1) m/lake and other human use (1) d/upland (e.g. forest), complex (1) or upland corridor (1) saturation. Score one or dbl check. anently inundated/saturated (4) dated/saturated (3) indated (2) turated in upper 30cm (12in) (1)
G max 20 pts.	17 subtotal		Iteration and Develop		
	Jobotal this p.	-) Inly one and assign score. double check and average.) Check all disturbances observed mowing grazing	shrub/sapling r herbaceous/ac ≤ sedimentation dredging farming nutrient enrich	quatic bed removal

WETLAND 9



Gitegory 1

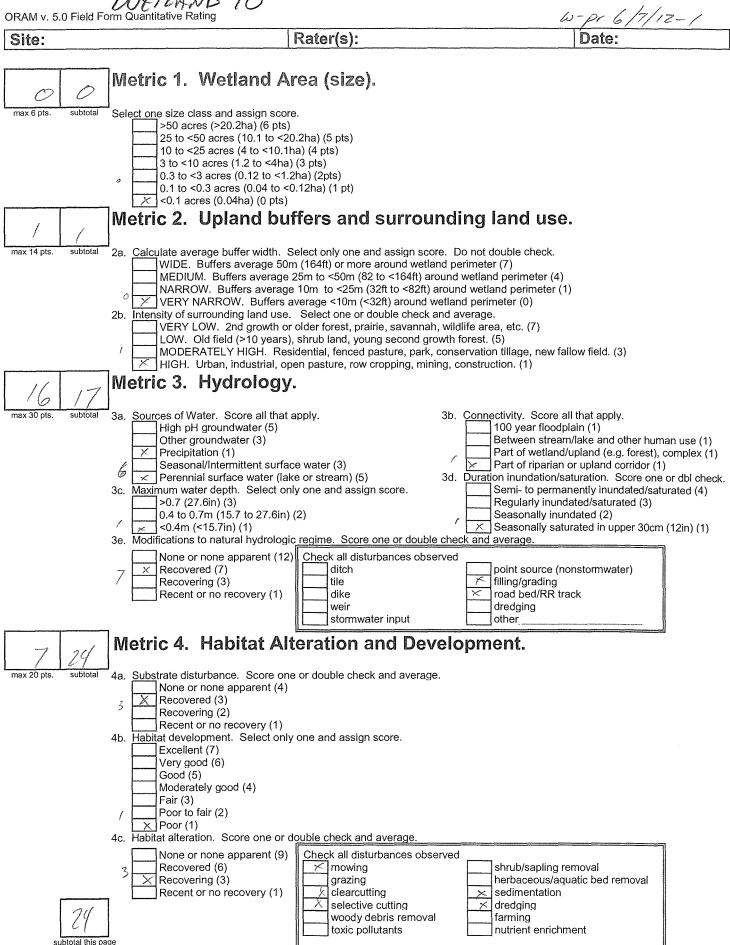
End of Quantitative Rating. Complete Categorization Worksheets.

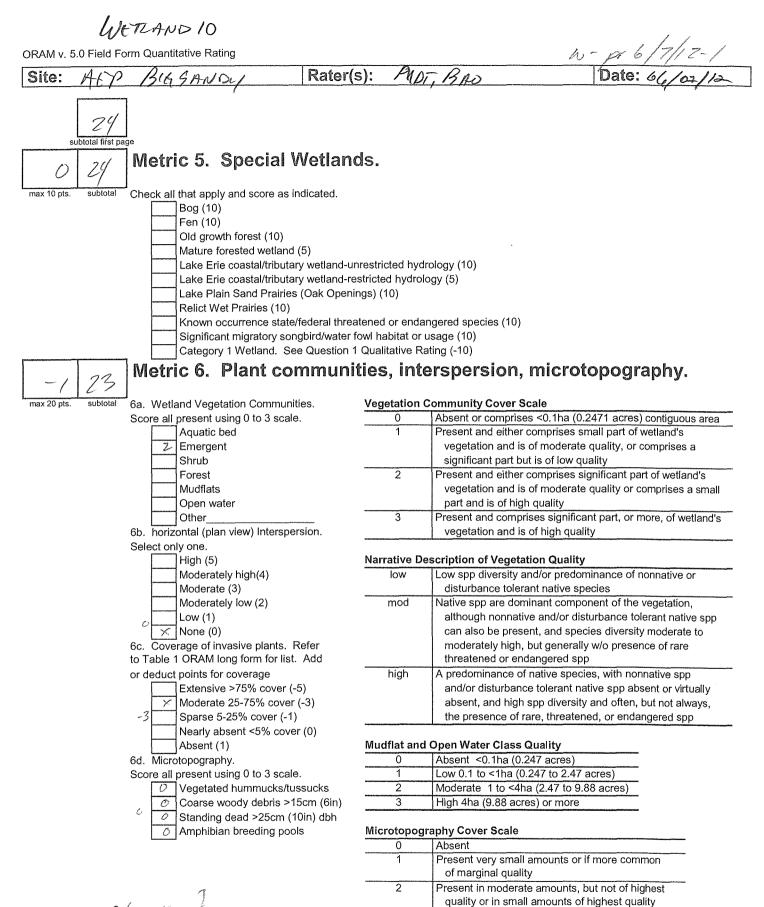
3

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts

ORAM v. 5.0 Field Form Quantitative Rating



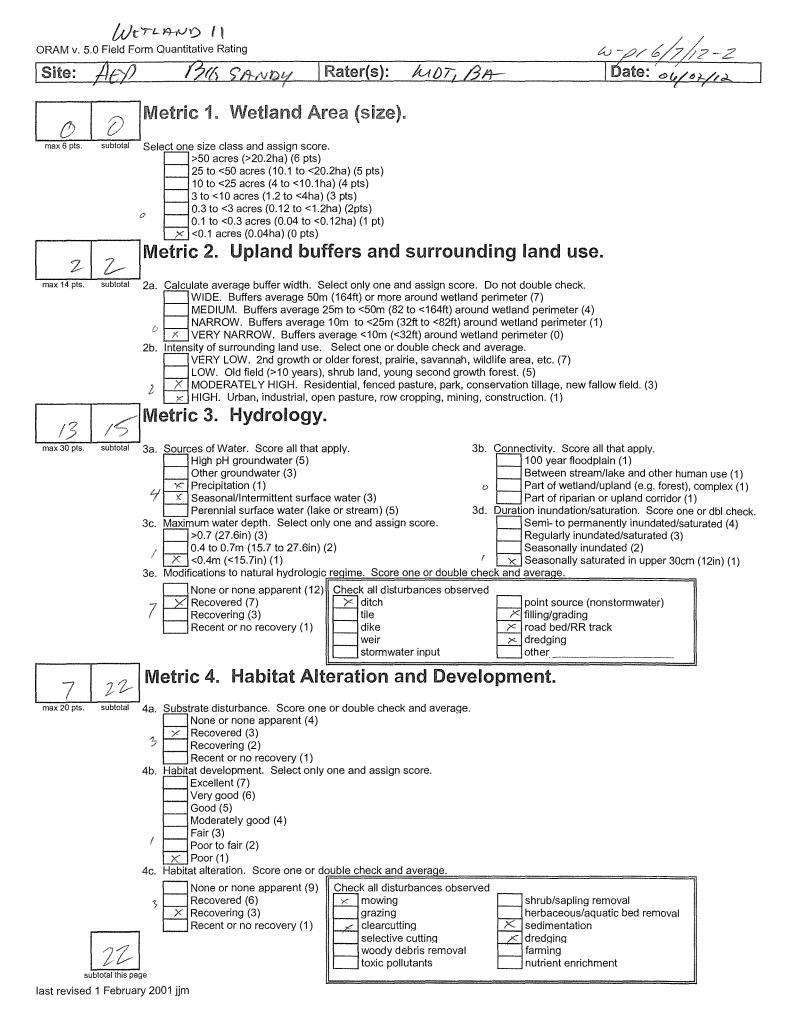


Gtegory 1

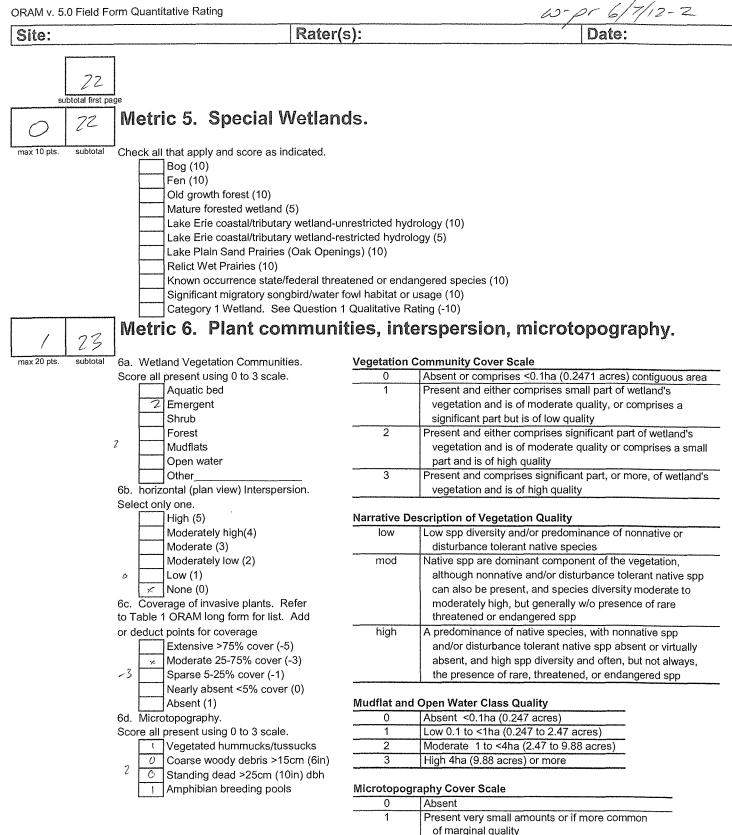
End of Quantitative Rating. Complete Categorization Worksheets.

3

Present in moderate or greater amounts



INFTUDNO 11



Catogory 1

End of Quantitative Rating. Complete Categorization Worksheets.

2

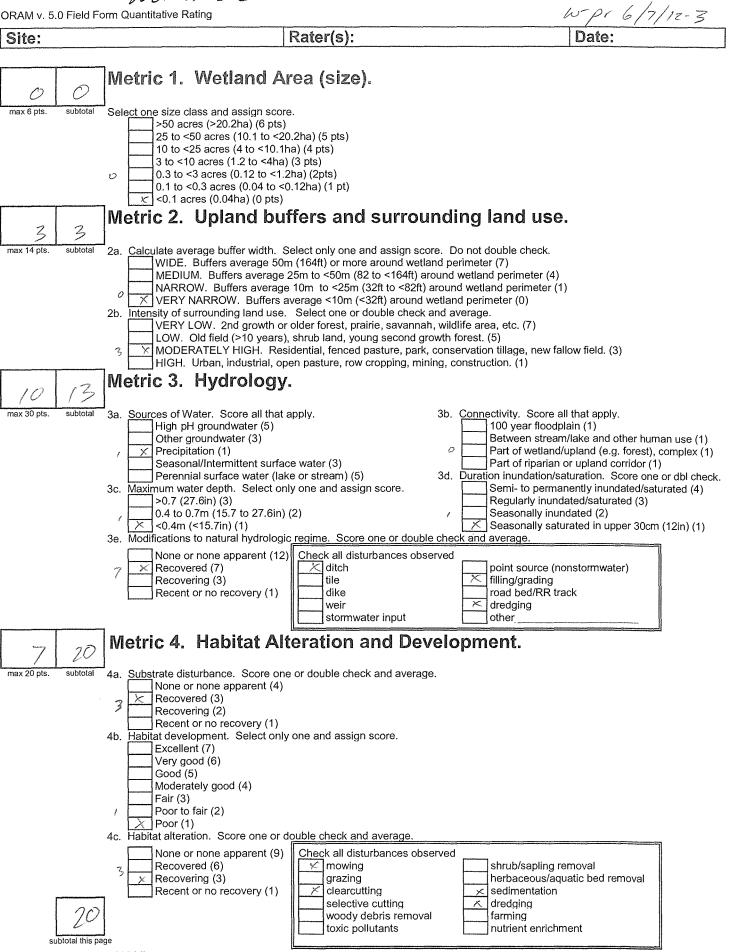
3

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts

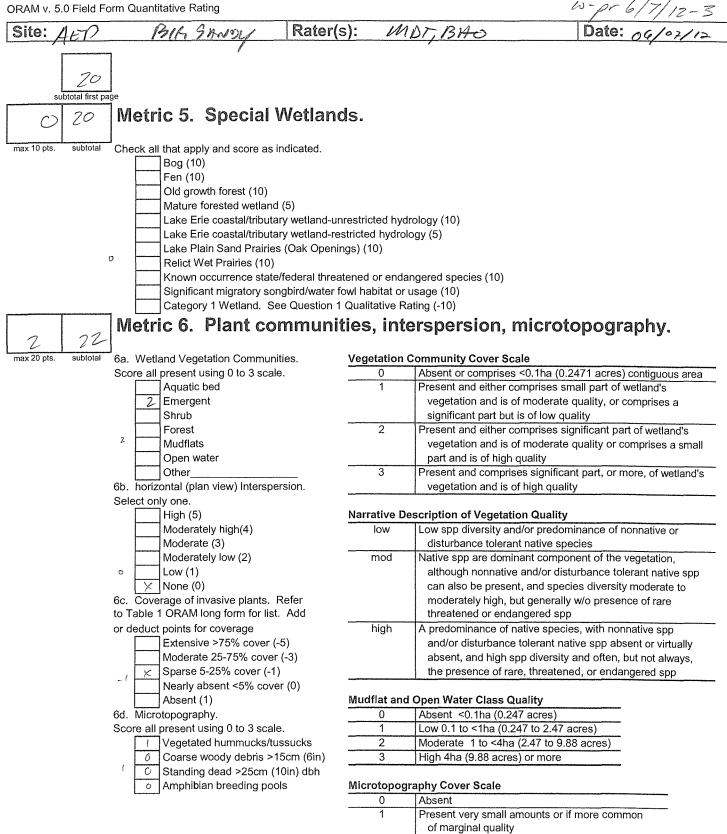
and of highest quality

WETZAND/2



last revised 1 February 2001 jim

NETLAND 12



Category 22

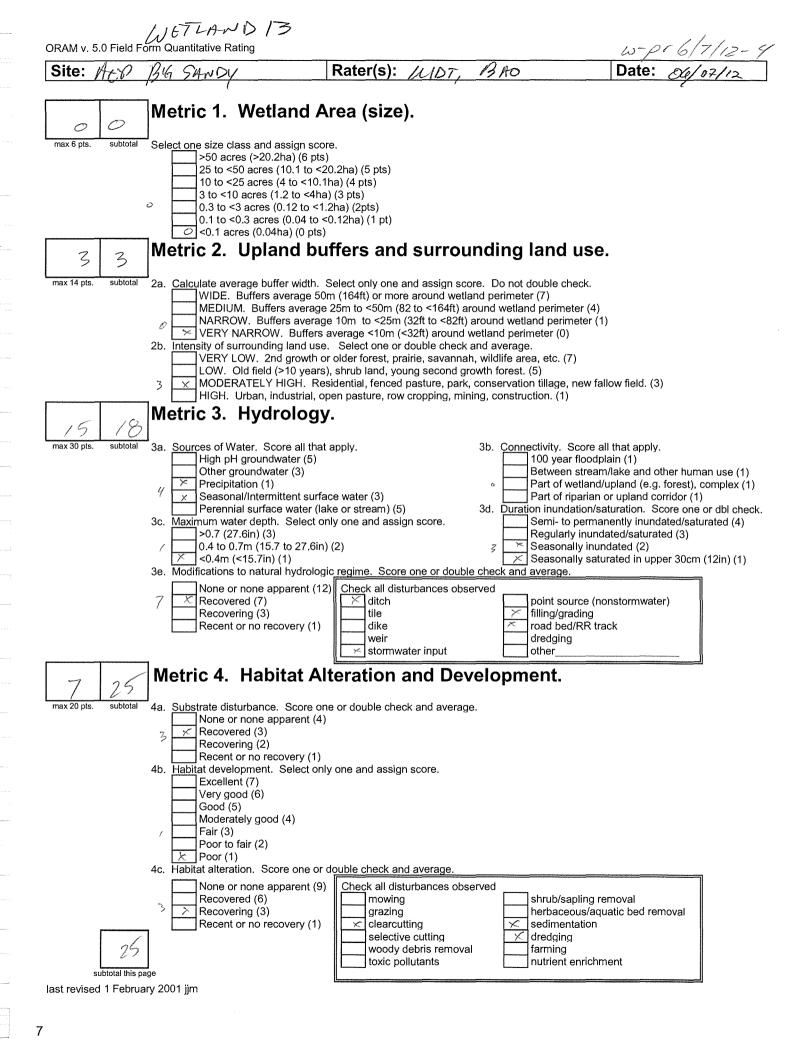
End of Quantitative Rating. Complete Categorization Worksheets.

2

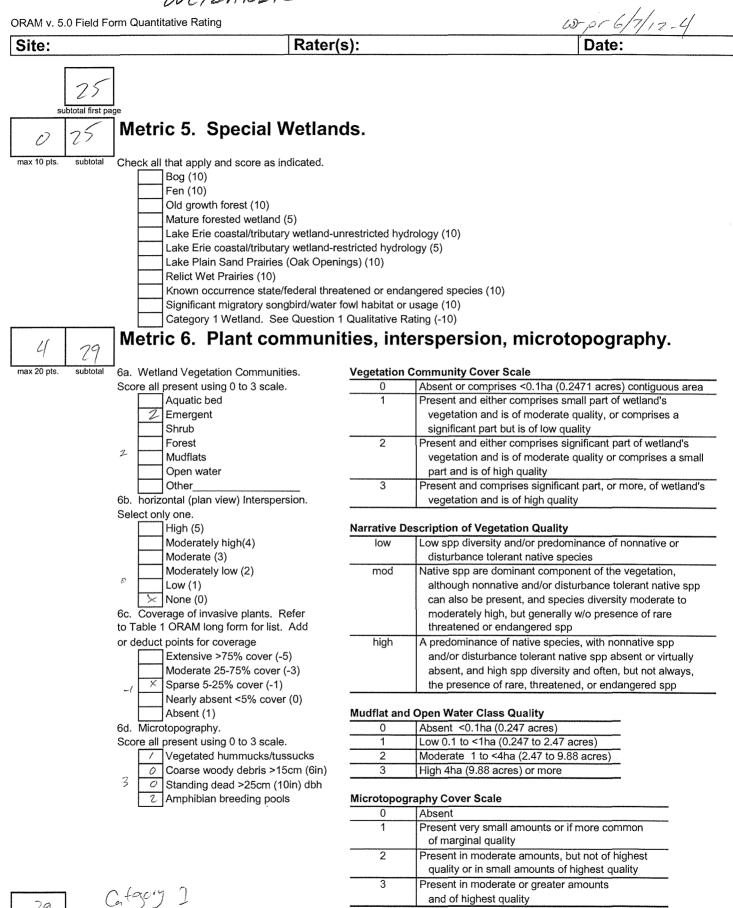
3

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

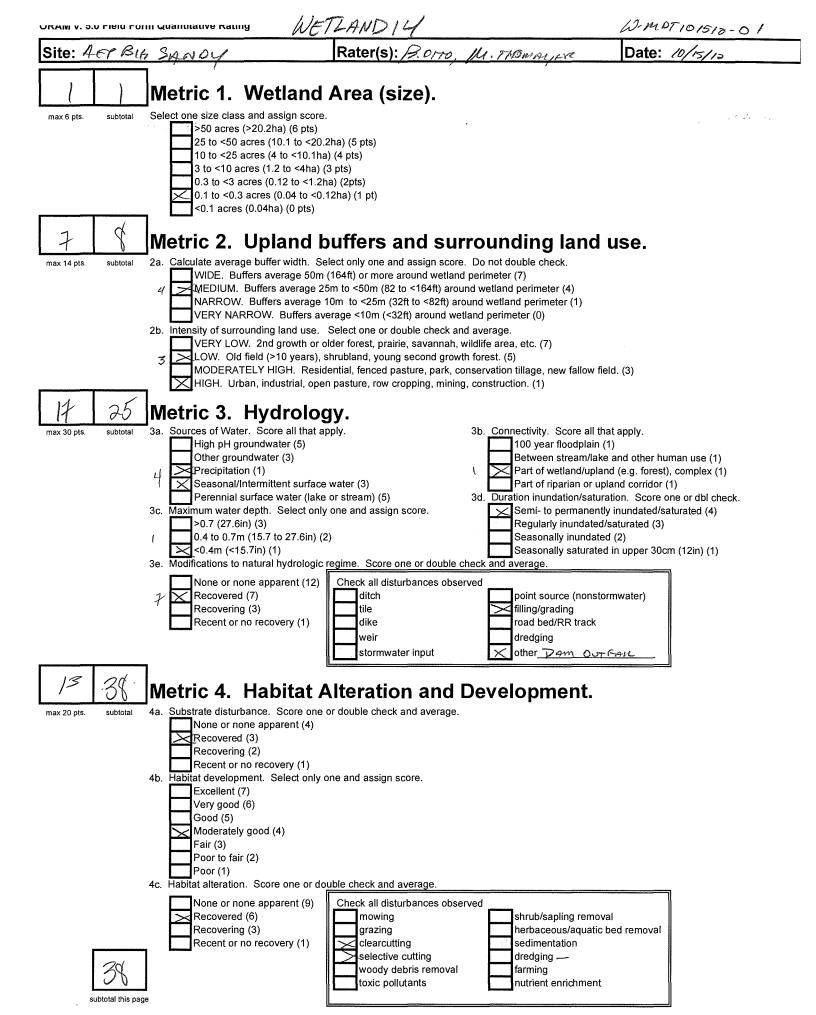
Present in moderate or greater amounts

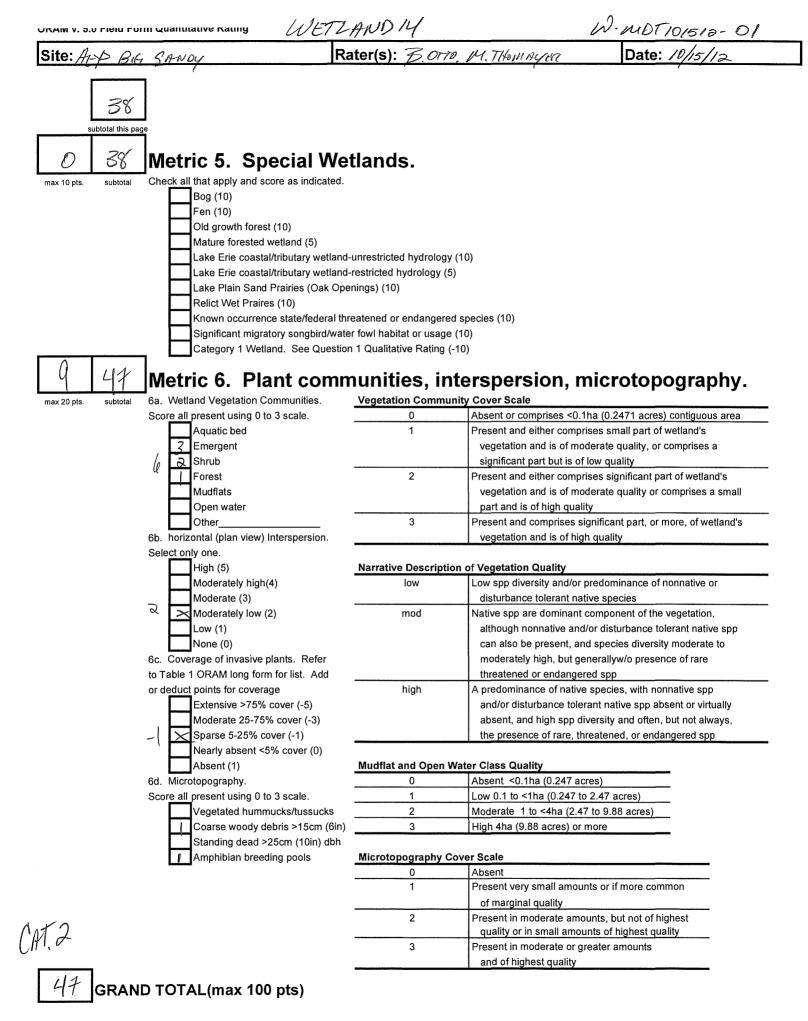


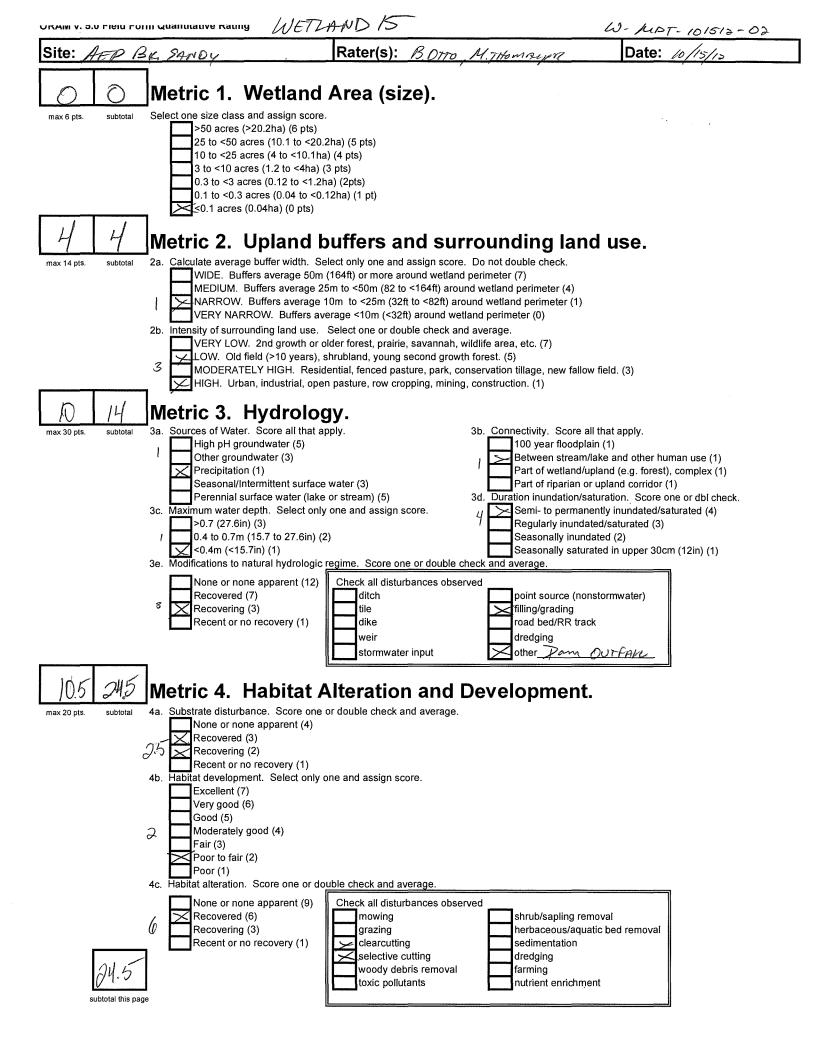
WETZAND13

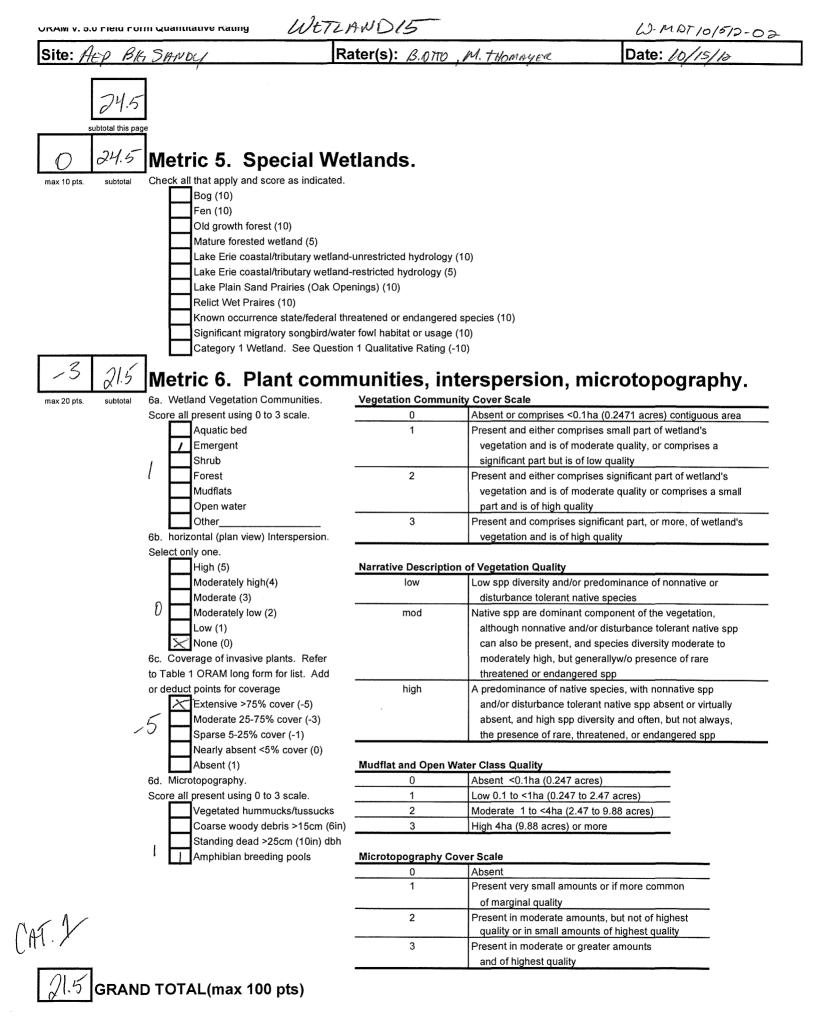


End of Quantitative Rating. Complete Categorization Worksheets.

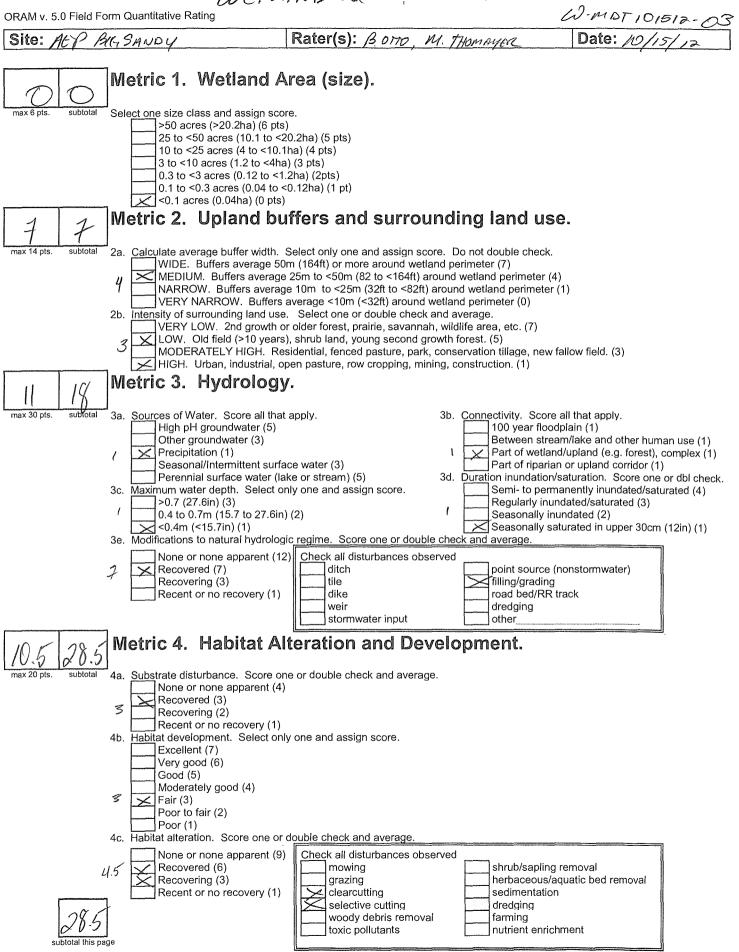








INFTUAND 14

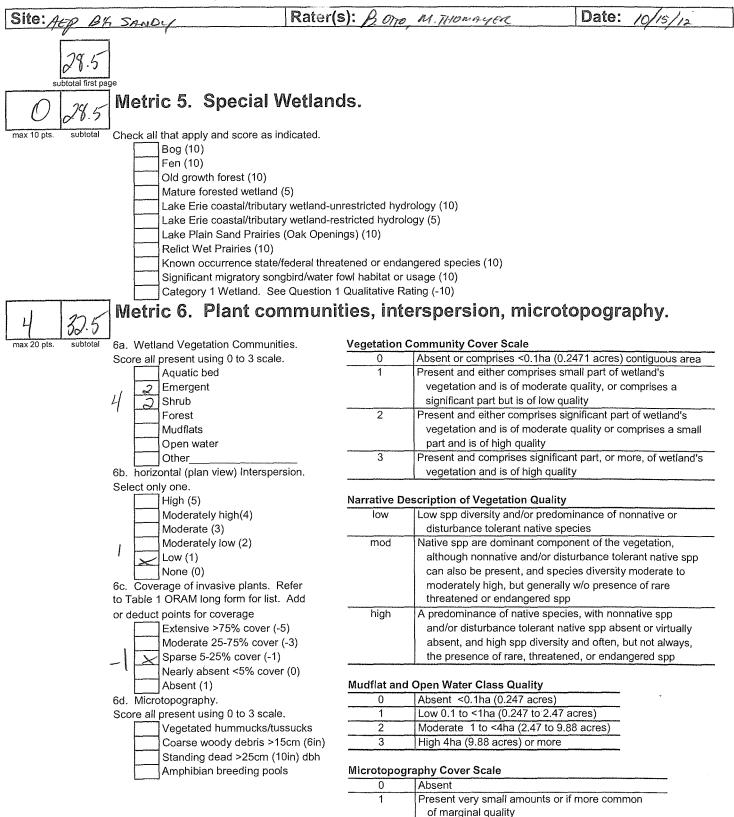


last revised 1 February 2001 jjm

WETTAND KE

W-MPT. 101512-03

ORAM v. 5.0 Field Form Quantitative Rating



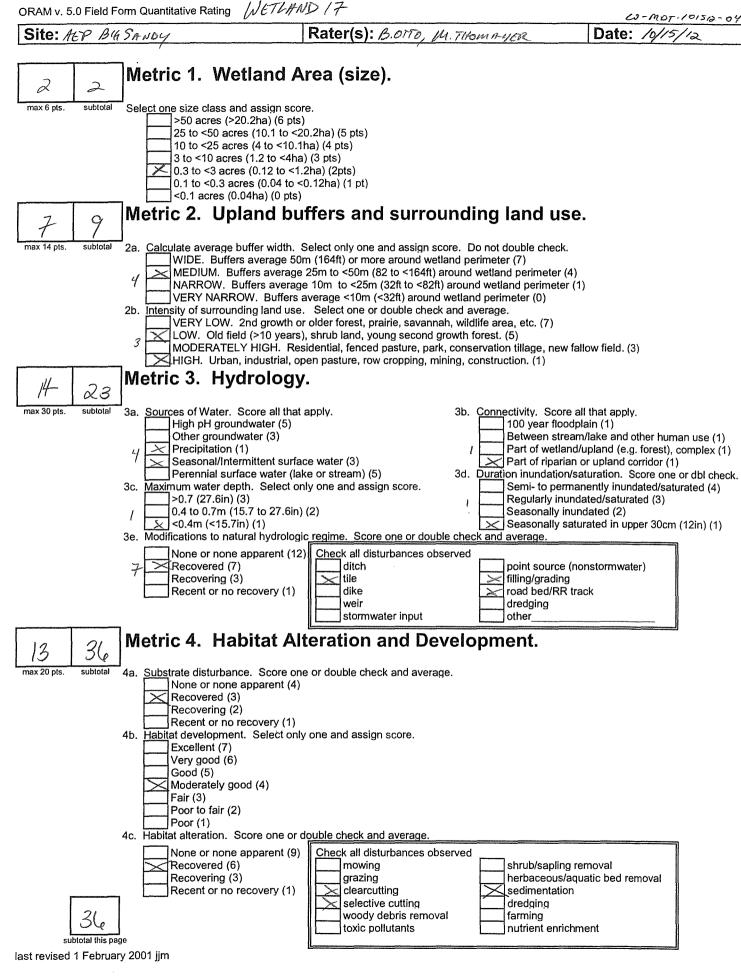
End of Quantitative Rating. Complete Categorization Worksheets.

2

3

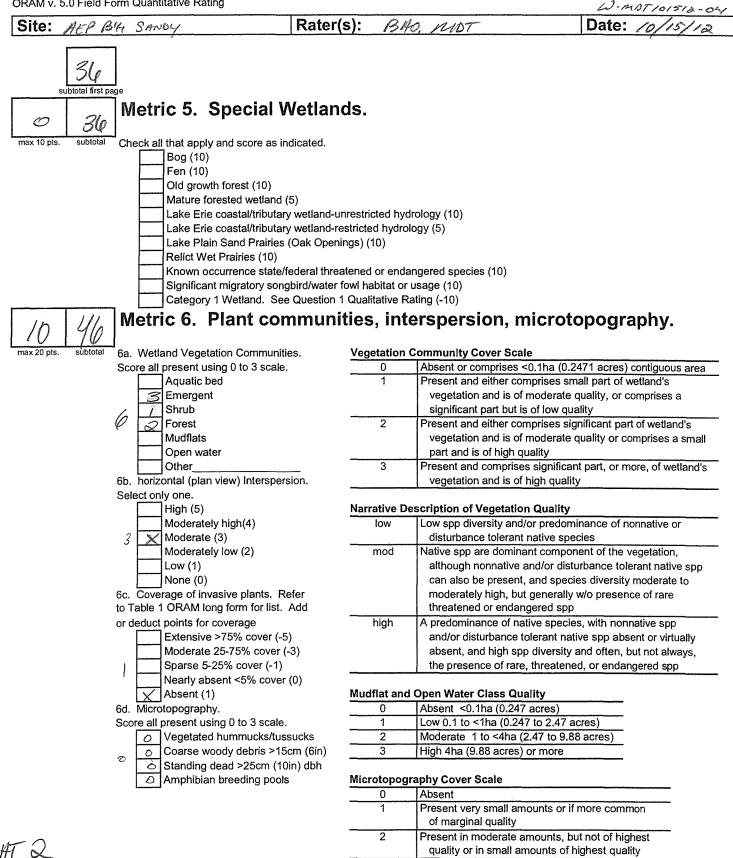
Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts



WETLAND 17

ORAM v. 5.0 Field Form Quantitative Rating



End of Quantitative Rating. Complete Categorization Worksheets.

3

quality or in small amounts of highest quality

Present in moderate or greater amounts



APPENDIX C

USACE FUNCTIONAL ASSESSEMENT FOR HIGH-GRADIENT EPHEMERAL AND INTERMITTENT STREAM FORMS



											Vers	ion 1-25-11
	High-G	radient l	Headwat	er Strea	ms in ea	stern Ke	entuc	cky a	and west	tern Wes	st Virgini	а
				Field [Data She	et and C	alcu	lato	r			
	Team:	M. Thomay	er, B. Otto					L	_atitude/UTI	M Northing:	38.179562	
Pr	oject Name:			re Project						-	-82.624478	}
			County, Ken		am Habitat A	(rea 1)			-	-	15 October	
S	AR Number:		-	Length (ft):	185	Stream Ty	vpe:	Enhe	meral Stream			
						· · · · · · · · · · · ·	/	Lpric				
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent cal	lculate	ed in V _{CCANC}	_{PPY})		
Site	and Timing:	Project Site				-	Before	e Proje	ct			-
Sample	e Variables											
1		equidistant 20%, enter	ercent cover points alone at least one measureme	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 9 to trigger	sapling	g cove	er is at least			95.5 %
								0.0	05	00	05	1
	100	90	90	100	95	100	1(00	95	90	95	
2	V _{EMBED}	along the s	nbeddednes tream. Sele	ect a particle	e from the b	ed. Before	moving	g it, de	etermine the	e percentag	e of the	2.5
			d area surro o the followi									
			e of 1. If the									
		Embedded	ness rating	for gravel, c	obble and b	oulder parti	cles (r	rescale	ed from Plat	tts, Megaha	n, and	
		Minshall 19	83)									
		Rating	Rating Des	cription								
		5			overed, sur						:k)	
		4			ace covered							
		3			face covere							
		2			face covere covered, su						ial curfaca)	
	Lict the rati		point below		covered, st	inounaea, c		eu by	ine seume		ial sullace)	l
	2		2	1	2	3		2	1	2	2	
	2	3		4	2	3		2 2	3		2	
			2						-	2		
	2	3	3	2	4	3		4	3	4	4	
3	V _{SUBSTRATE}		eam channe tream; use t							ghly equidis	tant points	0.08 in
			ches to the				w (bec	drock	should be c	ounted as 9	9 in,	
	asphalt or o	concrete as	0.0 in, sand	or finer par	ticles as 0.0)8 in):						
	0.08	0.08	0.08	0.08	0.08	0.50	0.	08	0.08	0.08	0.08	
	0.08	0.10	0.08	1.00	0.08	0.50	0.0	08	0.50	0.08	0.08	
	0.08	0.25	0.25	0.50	4.00	2.00	5.	00	4.00	10.00	11.00	
4	V _{BERO}		nt of eroded									
		side and th may be up	e total perce to 200%.	entage will b	e calculate	d If both ba	nks ar	re ero	ded, total e	rosion for th	e stream	16 %
			Left Bank:	15	5 ft	I	Right I	Bank:	15	5 ft		

Sampl	e Variable	s 5-9 within t	he entire r	iparian/buf	fer zone ad	jacent to tl	he stream cl	hannel (25	feet from e	ach bank).	
5	V_{LWD}	stream read	ch. Enter tl		rom the enti		eter and 36 ir buffer and w				3.2
			i or stream	WIII DE CAICI		downed w	oody stems:		6		
6	V_{TDBH}						ing cover is a	at least 20%	6). Trees ar	e at least 4	10.2
		,	,	neter. Enter							10.2
				nents of indi	vidual trees	(at least 4	in) within the	buffer on e	each side of		
		the stream	Left Side					Right Side			1
	8	10	6	12	8	9	12	9	8	6	
	14	5	9	11	12	7	16	6	10	11	
	12	16	11	10		13	15				
7	V _{SNAG}	Number of	snags (at le	east 4" dbh a	and 36" tall)	per 100 fee	et of stream.	Enter num	ber of snag	s on each	
				d the amoun					0		0.5
			Left Side:		1		Right Side:		0		
8	V _{SSD}	Number of			•	up to 4 inc	hes dbh) per			easure only	
_	330	if tree cove	r is <20%).	Enter num	per of saplin	gs and shr	ubs on each				Not Used
		amount per	100 ft of s Left Side:	tream will be	e calculated.		Dight Side:				
9	V _{SRICH}	Riparian ve			ess per 100	feet of strea	Right Side: am reach. C	heck all sp	ecies prese	nt from	
-	SRICH	Group 1 in	the tallest s	stratum. Ch	eck all exoti	c and invas	ive species p	present in a			2.70
				and the subi	ndex will be	calculated	from these c				
	A		p 1 = 1.0	14			A !!	•	2 (-1.0)	1	
✓ 	Acer rubr			Magnolia ti			Ailanthus a			Lonicera ja	
	Acer sace			Nyssa sylv			Albizia julib			Lonicera ta	
	Aesculus			Oxydendrun	n arboreum		Alliaria peti	olata		Lotus corn	
	Asimina t	riloba	\checkmark	Prunus sei	rotina		Alternanthe			Lythrum sa	alicaria
	Betula alle	ghaniensis	\checkmark	Quercus a	lba		philoxeroid	es		Microstegiur	m vimineum
	Betula ler	nta		Quercus c	occinea		Aster tatari	cus		Paulownia	tomentosa
	Carya alb	а		Quercus in	nbricaria		Cerastium	fontanum		Polygonum	cuspidatum
	Carya gla	bra		Quercus p	rinus		Coronilla va	aria		Pueraria m	ontana
	Carya ova	alis		Quercus ru	ıbra		Elaeagnus u	mbellata		Rosa multi	flora
v	- Carya ova			Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
✓	Cornus flo			Sassafras			Lespedeza			Verbena bi	-
	Fagus gra			Tilia ameri			Ligustrum ob				
		americana		Tsuga can			Ligustrum s				
	Liriodendro			Ulmus ame			9456.411				
				Unitus aille	ana						
	waynoila	acuminata									
		5	Species in	Group 1				0	Species in	Group 2	

		10-11 withi								n 25 feet fro	om each
banк. 10	V _{DETRITUS}	bplots shou Average pe			equidistant sticks, or oth					er and	
		<36" long a		-	ercent cove	r of the detr	=	-	ot.		91.88 %
		80	Left 100	Side 95	85	100	Righ 95	t Side 90	85		
		100	100	90	95	100	100	75	80		
11	V_{HERB}				aceous veg						
					oh and 36" ta h 200% are				, ,		Not Used
		at each sub		Side			Righ	t Side		1	
			Leit	olde			Right			1	
Sample	e Variable 1	2 within the									
12	V _{WLUSE}	Weighted A	verage of F	Runoff Score	e for watersl	ned:					1.00
			Lond		o From Dro	n Lint)			Runoff	% in	Running
			Land		se From Dro	p List)			Score	Catch- ment	Percent (not >100)
	Forest and r	native range (>75% ground	d cover)				•	1	100	100
								•			
								•			
								•			
								•			
								•			
								•			
								•			
	Su	immary					No	tes:			
Va	ariable	Value	VSI								
Vc	CANOPY	96 %	1.00								
V _{EI}	MBED	2.5	0.65								
Vsu	UBSTRATE	0.08 in	0.04								
	ERO	16 %	0.99								
VL		3.2	0.41								
	ОВН	10.2	1.00								
	NAG	0.5	0.91								
Vs		Not Used	Not Used								
	RICH	2.70	1.00								
	ETRITUS	91.9 %	1.00								
	ERB	Not Used	Not Used								

												ion 1-25-11
	High-G	radient	Headwat					-		ern Wes	st Virgini	а
				Field [Data She	et and C	alcu	lator	-			
	Team:	M. Thomay	er, P. Renn	er				L	atitude/UTI	M Northing:	38.182254	
Pr	oject Name:	Big Sandy	Pond Closu	re Project				Lo	ongitude/UT	M Easting:	-82.62765	
	Location:	Lawrence (County, Ken	tucky (Strea	am Habitat A	(rea 2			Sam	pling Date:	5 June 201	2
S/	AR Number:		Reach	Length (ft):	88	Stream Ty	/pe:	Epher	meral Stream			-
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent calo	culate	d in V _{CCANO}	PY)		
Site	and Timing:	Project Site	9			-	Before	Projec	t			-
Sampl	e Variables	1-4 in strea	am channel									
1		equidistant 20%, enter	ercent cover points alon at least one measureme	g the strean value betw	n. Measure veen 0 and 1	only if tree/	sapling	g cove	r is at least			87.0 %
	100	100	100	100	95	100	10	0	95	65	15	
	100	100	100	100		100	10	<u> </u>		00	10	
2	V _{EMBED}	along the s	nbeddednes tream. Sele d area surro	ect a particle	e from the b	ed. Before i	moving	g it, de	termine the	percentag	e of the	1.9
			the followi									
			e of 1. If the									
			ness rating	for gravel, c	obble and b	oulder parti	cles (re	escale	ed from Plat	ts, Megaha	n, and	
		Minshall 19	983)									
		Rating	Rating Des	scription								
		5				rounded, or					:k)	
		4				, surrounde						
		3				d, surround						
		2	51 to 75 pe			<u>a, surrouna</u> irrounded, c					ial surface)	
	l ist the rati		point below		covered, st	inounueu, c		ubyi			iai sullace)	
	1	2	1	. 2	3	2	2		2	1	2	
	2	3	1	2	1	2	2		2	1	2	
	2	2	3	1	1	2	3		3	2	3	
	2	2	3	1		2	3		3	2	3	
3		along the s	eam channe tream; use t	he same po	pints and pa	rticles as us	ed in \	/ _{EMBEC}).			0.08 in
			ches to the 0.0 in, sand				w (bed	rock s	hould be c	ounted as 9	9 in,	
	0.08	0.08	0.08	1.00	0.08	0.20	0.0	8	0.50	0.08	0.08	
	0.08	0.40	0.50	1.50	0.08	0.08	0.0		0.08	0.08	0.10	
	0.25	0.50	0.08	1.00	0.08	4.00	0.5		2.00	1.00	0.08	
4	V _{BERO}		ent of eroded e total perce to 200%.									8 %

Sampl	e Variable:	s 5-9 within t	the entire r	iparian/buf	fer zone ad	jacent to tl	ne stream c	hannel (25	feet from e	ach bank).	
5	V_{LWD}	stream rea	ch. Enter t	he number f	rom the enti		eter and 36 ir buffer and v				3.4
		per 100 tee	et of stream	will be calcu		downed w	oody stems:		3		
6	V _{TDBH}	Average dt	oh of trees (measure on			ng cover is a		6). Trees ar	e at least 4	10.7
		inches (10	cm) in dian	neter. Enter	tree DBHs	in inches.					10.7
				nents of indi	vidual trees	(at least 4	in) within the	buffer on e	each side of		
		the stream	below: Left Side			1		Right Side			1
	10	11	Leit Side	12	9	15	12	Side 9	13	11	
	10	6	4	12	6	13	9	8	7	12	
	11	7	13	14	21	18	13	9	7	11	
	7	5	10								
7	V _{SNAG}	Number of	snags (at le	east 4" dbh a	and 36" tall)	per 100 fe	et of stream.	Enter num	ber of snag	s on each	
	* SNAG			d the amoun				Linoi Haii	is of of onlag		2.3
			Left Side		1		Right Side:		1		
8	V_{SSD}						hes dbh) pe				Netlleed
				Enter num tream will be			ubs on each	side of the	stream, and	the	Not Used
			Left Side				Right Side:				
9	V _{SRICH}						am reach. C				
							ive species from these of		all strata. Sp	Decies	6.82
		-	1 = 1.0						2 (-1.0)		
\	Acer rubr		<u> </u>	Magnolia ti	ripetala		Ailanthus a			Lonicera ja	ponica
	Acer sace	harum		Nyssa sylv	atica		Albizia julik	orissin		Lonicera ta	atarica
	Aesculus	flava		Oxydendrun			Alliaria peti			Lotus corn	iculatus
	Asimina ti		<u> </u>	Prunus ser			Alternanthe			Lythrum sa	
		ghaniensis	 ✓ 	Quercus al			philoxeroid			Microstegiu	
	Betula ler	-		Quercus co			Aster tatari			•	tomentosa
	Carya alb			Quercus in			Cerastium			Polygonum	
	Carya gla			Quercus pi			Coronilla v			Pueraria m	
	Carya ova		✓	Quercus ru			Elaeagnus u			Rosa multi	
~	Carya ova	ata		Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
	Cornus flo	orida		Sassafras	albidum		Lespedeza	cuneata		Verbena bi	rasiliensis
\checkmark	Fagus gra	andifolia		Tilia amerio	cana		Ligustrum ol	btusifolium			
	Fraxinus a	americana		Tsuga can	adensis		Ligustrum	sinense			
	Liriodendro	on tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
		6	Species in	Group 1				0	Species in	Group 2	
		U	Opecies III					U	opecies III		

-					-			arian/buffer		n 25 feet fre	om each
bank. 1 10	The four sul							f the stream. Voody debris		ter and	
10	V DETRIIUS							each subplo			84.38 %
				Side			-	nt Side		ן י	
l		100 50	80 75	75	100 65	100	95 85	90	100		
11	V _{HERB}		75 ercentage co	100 over of herb		65 getation (mea	85 asure only it	95 if tree cover i	75 is <20%). [Do not	
	* HEIND	include woo	ody stems a	at least 4" dt	bh and 36" t	tall. Because	e there may	/ be several la	layers of gro	ound cover	Not Used
l		vegetation		s up througi	h 200% are	accepted.	Enter the pe	ercent cover	of grouna v	egetation	
				Side			Righ	nt Side]	
2-mpl)(Cithin th		i import of	1troom						
Sample 12	e Variable 1 V _{WLUSE}	12 within the Weighted A			the stream.						
	* WLUSE										1.00
			Lond		Dra	1:-4)			Runoff	% in	Running
			Lanu	Use (Choos	se From Dro	p Lisi)			Score	Catch- ment	Percent (not >100)
	Forest and r	native range (2	>75% ground	d cover)				•	1	100	100
	-							•			
l	e							•			
l I	F							•			
l I	F							•			
l I	•							•			
l I	•							•			
l	·							•			
	Su	ummary					Nc	otes:	<u> </u>		<u> </u>
V:	ariable	Value	VSI			reams have	e been rem	noved as a	result of hi	istorical wo	rk around
Vc	CANOPY	87 %	0.99	existing p	ond.						
VE	MBED	1.9	0.44								
Vs	UBSTRATE	0.08 in	0.04								
VB	ERO	8 %	1.00								
VL		3.4	0.43								
	DBH	10.7	1.00								
Vs	NAG	2.3	1.00								
Vs	SD	Not Used	Not Used								
	RICH	6.82	1.00								
VD	ETRITUS	84.4 %	1.00								
V _H	IERB	Not Used	Not Used	ĺ							

-											Versi	on 1-25-11
	High-G	radient l	Headwat					-		tern Wes	st Virgini	а
				Field E	Data She	et and C	alcul	lator	•			
	Team:	M. Thomay	ver, B. Otto					L	atitude/UTI.	M Northing:	38.183078	
Pr	oject Name:	Big Sandy	Pond Closu	re Project				Lo	ongitude/UT	M Easting:	-82.637348	
	Location:	Lawrence (County, Ken	tucky (Strea	am Habitat A	(rea 3)			Sam	pling Date:	24 May 201	2
S	AR Number:		Reach	Length (ft):	200	Stream Ty	/pe:	Epher	meral Stream	Ì.		•
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent calc	culate	d in V _{CCANO}	_{PY})		
Site	and Timing:	Project Site	ē			•	Before	Projec	t			•
Sampl	e Variables	1-4 in strea	am channel									
1	V _{CCANOPY}	Average pe equidistant 20%, enter	ercent cover points alon at least one measureme	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 9 to trigger	sapling	cove	r is at least			84.5 %
	100	95	85	100	95	100	10	0	85	65	20	
	100	30	00	100	30	100	10	<u> </u>	00	00	20	
2	V _{EMBED}	along the s	nbeddednes tream. Sele d area surro	ect a particle	e from the b	ed. Before	moving	it, de	termine the	percentag	e of the	1.8
			the followi									
			e of 1. If the								51113, use u	
			ness rating		-			-		ts. Megaha	n, and	
		Minshall 19	•	ior gravol, o		oundor parti	0100 (10	Joodio		ito, mogana	ii, and	
		Rating	Rating Des	crintion								
		5			overed, sur	rounded. or	buried	by fir	ne sedimen	t (or bedroc	k)	
		4			ace covered							
		3			face covere							
		2			face covere							
		1			covered, su	irrounded, c	or burie	d by f	ine sedime	nt (or artific	ial surface)	
			point below									h
	1	2	1	2	1	2	2		2	1	2	
	2	3	1	2	1	2	2		2	1	2	
	2	2	3	1	1	2	3		3	2	2	
3	V _{SUBSTRATE}		eam channe tream; use t							ghly equidis	tant points	0.08 in
	Enter partic	cle size in in	ches to the	nearest 0.1	inch at eac	h point belo	w (bedı	rock s	hould be c	ounted as 9	9 in.	
			0.0 in, sand				()				,	
	0.08	0.08	0.08	0.50	0.08	0.20	0.0	8	0.50	0.08	0.08	
	0.08	0.08	0.08	0.08	0.08	0.08	0.0		0.08	0.08	0.10	
	0.25	0.50	0.08	1.00	0.08	2.00	0.5		2.00	1.00	0.08	
	0.20	0.00	0.00	1.00	0.00	2.00	0.0		2.00	1.00	0.00	
4	Vara	Total perce	ent of eroded	stream ch	annel hank	Enter the t	otal nur	mber	of feet of o	oded bank	on each	
4	V _{BERO}											
		may be up	-	entage will c	e calculate	d If both ba	nks are	e eroo	ded, total e	rosion for th	e stream	14 %

Sampl	e Variable	s 5-9 within t	the entire r	iparian/buf	fer zone ad	jacent to t	he stream ch	annel (25	feet from e	ach bank).	
5	V_{LWD}						eter and 36 in buffer and w				2.0
		per 100 fee	et of stream	will be calc							
6	<u>\</u>	Average d	h of trace (oody stems:	t looot 200	4 () Trace or	a at lagat 4	
6	V _{TDBH}				tree DBHs i		ing cover is a	l least 20%	o). Trees ar	e al least 4	8.5
			,				in) within the	buffer on e	each side of		
		the stream				(ut loudt l					
			Left Side					Right Side			
	10	11	8	12	9	9	12	9	13	11	
	12	6	4	5	6	5	9	8	7	6	
	9	7	13	8	6	5	6	9	7	11	
	7	5				10	13				
7	V _{SNAG}						et of stream.	Enter num	ber of snag	s on each	
		side of the	stream, and	d the amour	nt per 100 fe	et will be ca	alculated.				0.0
			Left Side:		0		Right Side:		0		
8	V _{SSD}	Number of			oody stems	up to 4 inc	hes dbh) per	100 feet o	f stream (me	easure only	
							ubs on each s	side of the	stream, and	I the	Not Used
		amount pe	r 100 ft of s Left Side:		e calculated.		Right Side:				
9	V _{SRICH}	Riparian ve			ess per 100	feet of strea	am reach. Cl	neck all sp	ecies preser	nt from	
	SIGOT	Group 1 in	the tallest s	stratum. Ch	eck all exoti	c and invas	ive species p	resent in a			2.85
		-		and the subi	ndex will be	calculated	from these d		- /		
			p 1 = 1.0		• • •		A '1 4		2 (-1.0)	,	
~	Acer rubr			Magnolia t	-		Ailanthus al			Lonicera ja	-
	Acer saco	harum		Nyssa sylv			Albizia julibi	rissin		Lonicera ta	ntarica
	Aesculus	flava		Oxydendrun	n arboreum		Alliaria petio	olata		Lotus corn	iculatus
	Asimina t	riloba	~	Prunus sei	rotina		Alternanthe	ra		Lythrum sa	licaria
	Betula alle	ghaniensis	\checkmark	Quercus a	lba		philoxeroide	es		Microstegiur	n vimineum
	Betula ler	nta		Quercus c	occinea		Aster tatario	cus		Paulownia	tomentosa
	Carya alb	а		Quercus in	nbricaria		Cerastium f	ontanum		Polygonum o	cuspidatum
	Carya gla			Quercus p	rinus		Coronilla va	nria		Pueraria m	
	Carya ova		 Image: A start of the start of	Quercus ru			Elaeagnus ui	mbellata	<u> </u>	Rosa multi	flora
	Carya ova			Quercus v			Lespedeza			Sorghum h	
	Cornus flo			Sassafras			-			Verbena bi	-
							Lespedeza			verberia Di	23111211313
	Fagus gra			Tilia ameri			Ligustrum ob				
		americana		Tsuga can			Ligustrum s	inense			
✓	Liriodendro	on tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
		7	Species in	Group 1				1	Species in	Group 2	
		1	50000 III	Sloup i				I	Sheeres III		

10	V _{DETRITUS}				sticks, or otl percent cove				s <4" diamet ot.	er and	88.44 %
			Left	Side			Righ	t Side]	
		100	100	85	90	100	95	100	70		
		100	75	80	65	100	85	95	75		
11	V _{HERB}	include woo	ody stems a percentage	t least 4" d	bh and 36" t	all. Becaus	e there may	be several	is <20%). E layers of gro of ground v	ound cover	Not Use
			Left	Side			Righ	t Side			
ampl	e Variable '	12 within the	e entire cat	chment of	the stream						
12	V _{WLUSE}	Weighted A	Average of F	Runoff Scor	e for waters	hed:					0.60
			Land	Use (Choo	se From Dro	n List)			Runoff	% in Catch-	Runnin
			Land	000 (01100		, p =:ot)			Score	ment	(not >100
	Forest and r	native range (>75% ground	d cover)				-	1	35	35
	Forest and i	native range (50% to 75%	ground cove	r)			-	0.7	35	70
		ed areas (bare	2.44.44.4.4					-	0	30	100
			Soll, no vege	cation of pa	veniency				0		100
								_			
								•			
								•			
								• •			
								* * *			
								•			
		ummary					Nc	*			
V		-	VSI	Landuse	above strea	am channe		tes:	n past. App	Dears the a	area was
	'ariable	Value	VSI 0.95		above strea			tes:	n past. App	pears the a	area was
٧c	ariable	Value 85 %	0.95					tes:	n past. App	bears the a	area was
V _c V _E	ariable CCANOPY	Value 85 % 1.8						tes:	n past. App	bears the a	area was
V _c V _E	ariable	Value 85 %	0.95					tes:	n past. App	bears the a	area was
V _c V _E V _s	ariable CCANOPY	Value 85 % 1.8	0.95 0.40					tes:	n past. App	bears the a	area was
V _C V _E V _S	'ariable CCANOPY EMBED SUBSTRATE BERO	Value 85 % 1.8 0.08 in	0.95 0.40 0.04					tes:	n past. App	pears the a	area was
V _C V _E V _S V _E V _L	'ariable CCANOPY EMBED SUBSTRATE BERO WD	Value 85 % 1.8 0.08 in 14 %	0.95 0.40 0.04 1.00					tes:	n past. App	bears the a	area was
V _C V _E V _E V _L V _L	Yariable CCANOPY EMBED SUBSTRATE BERO .WD	Value 85 % 1.8 0.08 in 14 % 2.0 8.5	0.95 0.40 0.04 1.00 0.25					tes:	n past. App	bears the a	area was
	Yariable CCANOPY EMBED SUBSTRATE BERO WD TDBH SNAG	Value 85 % 1.8 0.08 in 14 % 2.0	0.95 0.40 0.04 1.00 0.25 0.96					tes:	n past. App	pears the a	area was
	Yariable CCANOPY EMBED SUBSTRATE BERO WD TDBH SNAG SSD	Value 85 % 1.8 0.08 in 14 % 2.0 8.5 0.0 Not Used	0.95 0.40 0.04 1.00 0.25 0.96 0.10 Not Used					tes:	n past. App	pears the a	area was
V _C V _E V _E V _L V _T V _S V _S	Yariable CCANOPY EMBED SUBSTRATE BERO WD TDBH SNAG	Value 85 % 1.8 0.08 in 14 % 2.0 8.5 0.0	0.95 0.40 0.04 1.00 0.25 0.96 0.10					tes:	n past. App	bears the a	area was

												ion 1-25-11
	High-G	radient	Headwat	er Strea	ms in ea	stern Ke	entuc	ky a	and west	tern Wes	st Virgini	а
				Field [Data She	et and C	alcu	lato	r			
	Team:	M. Thomay	er, B. Otto					L	_atitude/UT	M Northing:	38.184279	
Pr	oject Name:	Big Sandy	Pond Closu	re Project				L	ongitude/UT	TM Easting:	-82.644254	ļ
	Location:	Lawrence (County, Ken	tucky (Strea	am Habitat 4	.)			-	-	3 May 2012	
S	AR Number:		-	Length (ft):	220	Stream Ty	, /pe:	Ephe	meral Stream			-
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perc	ent cal	culate	ed in V _{CCANC}) PY)		
Sito	and Timing:	teri ante terra					Before	Proje	rt			-
	_						Defore	rioje				
Sample	e Variables											
1	V _{CCANOPY}	equidistant 20%, enter	points along at least one	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 9 to trigger	sapling	g cove	er is at least			99.0 %
			measureme									1
	100	100	95	100	100	100	10	00	100	100	95	
2	V _{EMBED}	along the s	tream. Sele	ect a particle	e from the b	ed. Before	moving	g it, de	etermine the	e percentag		2.5
			d area surro the followi									
			e of 1. If the									
		-	ness rating		-			-		tts, Megaha	in, and	
		Minshall 19	983)									
		Rating	Rating Des	cription								
		5			overed, sur	rounded, or	buried	d by fi	ne sedimen	t (or bedroo	ck)	
		4			ace covered							
		3			face covere							
		2			face covere						ial aurfaga)	
	list the roti				covered, su	irrounded, c	or durie	ed by	nne sealme	nt (or aninc	iai sunace)	
			point below		0	0			4	0	0	h
	2	3	2	1	2	3	2		1	2	2	
	2	3	2	3	2	3	2		3	2	1	
	2	3	3	2	4	3	4	ł	3	4	4	
		Madin		lauk-trit	o uti - l - l ·	Mc	at		han 00	alah (a a 1 1 1	to at a state	
3	V _{SUBSTRATE}		eam channe tream; use t							gnly equidis	stant points	0.08 in
		-		-	-				-			
			ches to the				w (bed	lrock s	should be c	ounted as 9	99 in,	
		-	0.0 in, sand	-								1
	0.08	0.08	0.08	0.08	0.08	1.00	0.0		0.08	0.08	0.08	
	0.08	0.10	0.08	1.00	0.08	0.50	0.0		0.50	0.08	0.08	
	0.08	1.00	0.25	1.00	4.00	2.00	5.0	00	4.00	6.00	10.00	
4	V_{BERO}		ent of eroded									
		side and th may be up	e total perce to 200%.	entage will b	e calculate	d If both ba	nks ar	e ero	ded, total e	rosion for th	ne stream	14 %
			Left Bank:	17	′ ft		Right E	Bank:	14	1 ft		

Sampl	e Variable	s 5-9 within t	the entire r	iparian/buf	fer zone ad	jacent to tl	he stream c	hannel (25	feet from e	each bank).	
5	V_{LWD}	stream rea	ch. Enter tl	ne number f	rom the enti		eter and 36 ir buffer and v				2.7
		per 100 tee	et of stream	will be calcu		downed w	oody stems:		6		
6	V _{TDBH}	Average db	oh of trees (measure on			ing cover is a			e at least 4	
		inches (10	cm) in dian	neter. Enter	tree DBHs	in inches.					11.6
				nents of indi	vidual trees	(at least 4	in) within the	buffer on e	each side of		
		the stream				-		Dialet Cida			1
	8	10	Left Side	12	17	9	12	Right Side	13	6	
	14	5	9	11	17		12		10	14	
	12	16	11	10	14	13	15	10	18		
	13										
7	V _{SNAG}	Number of	snags (at le	ast 4" dhh :	and 36" tall)	per 100 fee	et of stream.	Enter num	ber of snag	s on each	
,	V SNAG			d the amoun				Enter Hum	ber of shag	S on cach	2.3
			Left Side:		3		Right Side:		2		
8	V_{SSD}						hes dbh) pe				Netlleed
				Enter num tream will be			ubs on each	side of the	stream, and	the	Not Used
		•	Left Side:				Right Side:				
9	V _{SRICH}						am reach. C				
							ive species		ill strata. Sp	Decies	2.73
		-	p 1 = 1.0						2 (-1.0)		
\	Acer rubr		П	Magnolia ti	ripetala		Ailanthus a			Lonicera ja	ponica
	Acer sace	harum		Nyssa sylv	atica		Albizia julik	orissin		Lonicera ta	atarica
	Aesculus	flava		Oxydendrun			Alliaria peti			Lotus corn	iculatus
	Asimina ti		 Image: A start of the start of	Prunus ser			Alternanthe			Lythrum sa	
		ghaniensis	 ✓ 	Quercus al			philoxeroid			Microstegiur	
	Betula ler	-		Quercus co			Aster tatari			•	tomentosa
	Carya alb			Quercus in			Cerastium			Polygonum o	
	Carya gla			Quercus pi			Coronilla v			Pueraria m	
	Carya ova		✓	Quercus ru			Elaeagnus u			Rosa multi	
~	Carya ova	ata		Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
~	Cornus flo	orida		Sassafras	albidum		Lespedeza	cuneata		Verbena bi	rasiliensis
	Fagus gra	andifolia		Tilia amerio	cana		Ligustrum ol	btusifolium			
	Fraxinus	americana		Tsuga can	adensis		Ligustrum	sinense			
	Liriodendro	on tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
			0	0					<u> </u>	0 0	
		6	Species in	Group 1				0	Species in	Group 2	

		10-11 withi								n 25 feet fro	om each
		bplots shou								<u> </u>	
10	V _{DETRITUS}				sticks, or oth percent cove					er and	93.75 %
				Side				it Side		<u> </u>	
		95	100	65	100	100	95	90	100		
11	V _{HERB}	100 Average pe	100 ercentage co	90 over of herb	95 baceous vege	100 letation (mea	100 asure only if	75 f tree cover i	95 is <20%). [no not	
	* HEKB	include woo	ody stems a	at least 4" db	bh and 36" ta	all. Because	e there may	be several l	layers of gro	ound cover	Not Used
		vegetation		s up through	h 200% are	accepted.	Enter the pe	rcent cover	of ground v	egetation	1101 0000
				Side			Righ	it Side		1 '	
Sample 12		12 within the			the stream.						
12	V _{WLUSE}		Welaye of the		3 IUI watersi	ileu.					1.00
			land	Llee (Choos	se From Dro	n liet)			Runoff	% in Catch-	Running Percent
						р Listy			Score	ment	(not >100)
	Forest and r	native range (3	>75% ground	d cover)				-	1	100	100
								•			
								•			
								•			
								•			
								-			
								•			
	Su	ummary					No	otes:			
Va	ariable	Value	VSI	Streams a	are within m	nature upla	and forest.				
Vc	CANOPY	99 %	1.00								
V _{EI}	MBED	2.5	0.64								
V _{SI}	UBSTRATE	0.08 in	0.04								
V _B	ERO	14 %	1.00								
VLV	WD	2.7	0.34								
V _{TI}	DBH	11.6	1.00								
Vs	NAG	2.3	1.00								
Vs	SD	Not Used	Not Used								
Vs	RICH	2.73	1.00								
VD	ETRITUS	93.8 %	1.00								
V _H	ERB	Not Used	Not Used								

											ion 1-25-11
	High-G	radient l	Headwat					ky and wes	stern We	st Virgini	а
				Field [Data She	et and C	alcul	ator			
	Team:	M. Thomay	er, B. Otto					Latitude/U	TM Northing	: <mark>38.184011</mark>	
Pr	oject Name:	Big Sandy	Pond Closu	re Project				Longitude/L	JTM Easting	-82.647594	ļ
	Location:	Lawrence (County, Ken	tucky (Strea	am Habitat A	Area 5)		Sa	mpling Date	15 May 201	12
S	AR Number:		Reach	Length (ft):	310	Stream Ty	/pe:	Ephemeral Strea	m		•
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent calc	ulated in V _{CCAN}	IOPY)		
Site	and Timing:	Project Site				-	Before I	Project			•
Sampl	e Variables	1-4 in strea	am channel								
1	V _{CCANOPY}	equidistant 20%, enter	points alon	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 19 to trigger	sapling	Measure at no cover is at leas ata choice.)			98.5 %
	100	95	100	100	95	100	100) 95	100	100	6
	100	90	100	100	90	100	100	/ 95	100	100	
2	V _{EMBED}	along the s	tream. Sele	ect a particle	e from the b	ed. Before	moving	ewer than 30 ro it, determine the sediment, and	ne percentag	e of the	2.0
		according t	o the followi	ng table. If	the bed is a	an artificial s	surface,	or composed			
		-	e of 1. If the		-		÷				
	Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)										
		Rating	Rating Des								
		5 4						by fine sedime		CK)	
		4						ried by fine sec uried by fine se			
		2						uried by fine so			
		1						by fine sedim		cial surface)	
	List the rati	ngs at each	point below		1	,			Υ	,	1
	1	2	1	2	1	2	2	2	1	2	
	2	3	1	2	1	2	2	2	1	2	
	2	2	3	1	1	2	3	4	3	4	
							Ű				
3		along the s	tream; use t	he same po	pints and pa	rticles as us	ed in V				0.08 in
			ches to the 0.0 in, sand				w (bedr	ock should be	counted as §	99 in,	
	0.08	0.08	0.08	0.50	0.08	0.20	0.08	3 0.50	0.08	0.08	
	0.08	0.50	0.08	0.08	0.08	0.08	0.08	3 0.08	0.08	0.10	
	0.25	0.50	1.00	1.00	0.08	2.00	2.00) 6.00	8.00	5.00	
4	V _{BERO}				annel bank. De calculate			nber of feet of			C 0/
		may be up	-	inago ini i	o calculato			eroueu, ioiar		le stream	6 %

Sampl	e Variables	s 5-9 within t	the entire r	iparian/buf	fer zone ad	jacent to th	ne stream cl	nannel (25	feet from e	ach bank).	
5	V_{LWD}	stream rea	ch. Enter th	ne number f	rom the enti		ter and 36 ir buffer and w				1.9
		per 100 tee	et of stream	will be calcu		downed wo	oody stems:		6		
6	V _{TDBH}	Average dt	oh of trees (measure on			ng cover is a			e at least 4	
		inches (10	cm) in diam	eter. Enter	tree DBHs	in inches.					8.2
				nents of indi	vidual trees	(at least 4 i	n) within the	buffer on e	each side of		
	r	the stream				-		Dialet Cida			
	10	11	Left Side 8	12	9	9	12	Right Side	13	11	
	10	6	4	5	9 6	5	9	8	7	6	
	9	7	13	8	6	5	6	9	7	11	
	7	5	6	9	5	10	13	5	7	9	
	5	8	11			6	5	9	11		
7	V _{SNAG}	Number of	spage (at le	ast 4" dbb :	and 36" tall)	per 100 fee	et of stream.	Enter num	ber of spag	s on each	
,	V SNAG			d the amoun				Linter num	iber of shag	Soneach	0.6
			Left Side:		1		Right Side:		1		
8	V_{SSD}						hes dbh) per				Netlleed
				Enter num tream will be			ubs on each	side of the	stream, and	Ithe	Not Used
		amount po	Left Side:		, carculated.		Right Side:				
9	V _{SRICH}						am reach. C				
							ive species p from these c		ill strata. Sp	Decies	1.87
		-	p = 1.0			ouloulutou			2 (-1.0)		
\	Acer rubru			Magnolia ti	ripetala		Ailanthus a			Lonicera ja	ponica
	Acer sacc	harum		Nyssa sylv	•		Albizia julib	rissin		Lonicera ta	
	Aesculus			Oxydendrun			Alliaria peti			Lotus corni	
	Asimina tr		 Image: A start of the start of	Prunus ser			-			Lythrum sa	
		ghaniensis	 	Quercus al			Alternanthe			Microstegiur	
		-	_				-			-	
	Betula len			Quercus co			Aster tatari			Paulownia	
	Carya alb			Quercus in			Cerastium			Polygonum o	-
	Carya gla			Quercus pi			Coronilla va			Pueraria m	
	Carya ova	alis	\checkmark	Quercus ru	ıbra		Elaeagnus u	mbellata	\checkmark	Rosa multi	flora
~	Carya ova	ata		Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
	Cornus flo	orida		Sassafras	albidum		Lespedeza	cuneata		Verbena bi	rasiliensis
~	Fagus gra	ndifolia		Tilia amerio	cana		Ligustrum ob	otusifolium			
	Fraxinus a	americana		Tsuga can	adensis		Ligustrum s	sinense			
~	Liriodendro	n tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
			<u> </u>	a :					<u> </u>	a -	
		7	Species in	Group 1				1	Species in	Group 2	

										n 25 feet fro	om each
bank. 1 10	The four su V _{DETRITUS}	bplots shou						the stream. oody debris		or and	
10	V DETRITUS							each subplo			89.06 %
			Left	Side			Righ	t Side]	
		100	95	85	90	100	95	100	85		
11	V _{HERB}	100 Average pe	75 ercentage.co	80 over of herb	65 aceous veg	100 etation (me	85 asure only it	95 f tree cover i	75 s <20%) _[)o <i>not</i>	
••	* HEKB	include woo	ody stems a	t least 4" dl	oh and 36" t	all. Because	e there may	be several l	ayers of gro	ound cover	Not Used
		vegetation at each sub		s up throug	h 200% are	accepted.	Enter the pe	ercent cover	of ground v	regetation	
				Side			Righ	t Side]	
			_								
		2 within the									-
12	V _{WLUSE}	Weighted A	Average of F	Runoff Scor	e for waters	hed:					0.90
									Duraft	% in	Running
			Land	Use (Choos	se From Dro	p List)			Runoff Score	Catch-	Percent
	Forest and r	ative range (>75% around	d cover)				-	1	ment 65	(not >100) 65
		ative range (!			r)			-	0.7	35	100
				9.00110 0010	.,			-	0.7	00	100
								-			
								•			
								•			
								•			
								•			
	Su	mmary					No	tes:			
Va	ariable	Value	VSI		-		eas on pro	perty. Unde	erstory is c	lenser than	most
Vc	CANOPY	99 %	1.00	other loca	itions on pr	operty.					
VE	MBED	2.0	0.45								
Vs	UBSTRATE	0.08 in	0.04								
VB	ERO	6 %	1.00								
VL		1.9	0.24								
	DBH	8.2	0.90								
	NAG	0.6	1.00								
Vs		Not Used	Not Used								
	RICH	1.87	0.89								
	ETRITUS	89.1 %	1.00								
	ERB	Not Used	Not Used								

												ion 1-25-11
	High-G	radient l	Headwat					-		tern Wes	st Virgini	а
				Field [Data She	et and C	alcu	lato	r			
	Team:	M. Thomay	er, B. Otto					L	_atitude/UTI	M Northing:	38.177507	
Proje	ect Name:	Big Sandy	Pond Closu	re Project				L	ongitude/U1	TM Easting:	-82.639347	,
	Location:	Lawrence (County, Ken	tucky (Strea	am Habitat A	Area 6)			Sam	pling Date:	4 May 2012	2
SAR	R Number:		Reach	Length (ft):	180	Stream Ty	/pe:	Ephe	meral Stream			•
Т	op Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent cal	culate	ed in V _{CCANC}	_{PY})		
Site an	nd Timing:	Project Site				-	Before	e Projec	ct			•
Sample \	Variables	1-4 in strea	am channel									
		equidistant 20%, enter	ercent cover points alon at least one measureme	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 19 to trigger	sapling	g cove	er is at least			95.5 %
	100	100	100	100	95	100	10	0	95	100	65	
_	100	100	100	100	30	100			30	100	05	
2 V	/ _{EMBED}	along the s	nbeddednes tream. Sele d area surro	ect a particle	e from the b	ed. Before	moving	g it, de	etermine the	e percentag		1.8
			the followi									
											cm3, use u	
	rating score of 1. If the bed is composed of bedrock, use a rating score of 5. Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and											
		Minshall 19	•	ior gravol, o		ounder parti	0.00 (1	oooun		ito, mogana	in, and	
		Rating	Rating Des	scription								
		5			covered, sur	rounded, or	buried	d by fi	ne sedimen	t (or bedroo	:k)	
		4			ace covered							
		3			face covere							
			51 to 75 pe									
		1			covered, su	irrounded, c	or burie	ed by i	tine sedime	nt (or artific	al surface)	
			point below		4				•			ŀ
_	1	2	1	2	1	2	2		2	1	2	
_	2	3	1	2	1	2	2		2	1	2	
_	2	2	3	1	1	2	3	3	2	2	3	
3 V	SUBSTRATE		eam channe							ghly equidis	stant points	0.08 in
		along the s	tream; use t	ne same po	pints and pa	rticles as us	sed in	V EMBEI	D.			0.00 11
			ches to the				w (bed	lrock s	should be c	ounted as 9	99 in,	
a			0.0 in, sand	or finer par	ticles as 0.0	08 in):						1
	0.08	0.08	0.08	0.50	0.08	0.20	0.0	08	0.50	0.08	0.08	
	0.08	0.50	0.08	0.08	0.08	0.08	0.0	08	0.08	0.08	0.10	
	0.25	0.50	1.00	1.00	0.08	3.00	2.0	00	6.00	8.00	5.00	
4 V	/ _{BERO}		ent of eroded									
		side and th may be up	e total perce to 200%.	entage will b	be calculate	d If both ba	nks ar	e ero	ded, total e	rosion for th	ne stream	6 %
			Left Bank:	4	ft	l	Right E	Bank:	6	ft		

Sampl	e Variable:	s 5-9 within	the entire r	iparian/buf	fer zone ad	jacent to th	ne stream ch	nannel (25	feet from e	ach bank).	
5	V_{LWD}	stream rea	ch. Enter tl	ne number fi	rom the enti		ter and 36 in buffer and w				3.9
		per 100 fee	et of stream	will be calcu		downed wo	oody stems:		7		
6	V _{TDBH}	Average d	oh of trees (measure on			ng cover is a			e at least 4	
		inches (10	cm) in dian	neter. Enter	tree DBHs	in inches.					9.1
				nents of indi	vidual trees	(at least 4 i	n) within the	buffer on e	ach side of		
		the stream				-		Dialet Cida			
	10	11	Left Side 8	12	9	9	12	Right Side	13	11	
	10	6	0 4	5	9 6	9 5	12	9 8	15	6	
	9	13	15	8	6	5	6	13	7	11	
	12	11	12	9	5	10	13	5	7	9	
						6	5	9	11		
7	V _{SNAG}	Number of	spage (at l	aast 4" dbb :	and 36" tall)	per 100 fee	et of stream.	Enter num	ber of spag	s on each	
,	V SNAG			d the amoun				Linter Hum	ber of shay	Soneach	1.1
			Left Side:		2		Right Side:		0		
8	V_{SSD}						hes dbh) per				Netlleed
				tream will be			ubs on each :	side of the	stream, and	the	Not Used
		amount po	Left Side:		, carculated.		Right Side:				
9	V _{SRICH}						am reach. Cl				
							ive species p from these d		II strata. Sp	Decles	3.15
			p = 1.0			ouloulutou			2 (-1.0)		
\	Acer rubr			Magnolia ti	ripetala		Ailanthus a			Lonicera ja	ponica
	Acer sacc	harum		Nyssa sylv	•		Albizia julib	rissin		Lonicera ta	
	Aesculus			Oxydendrun			Alliaria peti			Lotus corn	
	Asimina ti		 Image: A start of the start of	Prunus ser						Lythrum sa	
		ghaniensis	<u> </u>	Quercus al			Alternanthe philoxeroide			Microstegiur	
		-	_				-			•	
	Betula ler			Quercus co			Aster tatario			Paulownia	
	Carya alb			Quercus in			Cerastium f			Polygonum (-
	Carya gla			Quercus pi			Coronilla va			Pueraria m	
	Carya ova	alis	7	Quercus ru			Elaeagnus ui	mbellata	\checkmark	Rosa multi	
~	Carya ova	ata		Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
	Cornus flo	orida		Sassafras	albidum		Lespedeza	cuneata		Verbena bi	rasiliensis
~	Fagus gra	andifolia		Tilia amerio	cana		Ligustrum ob	tusifolium			
	Fraxinus a	americana		Tsuga can	adensis		Ligustrum s	inense			
~	Liriodendro	on tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
		_	0	0					<u> </u>	0 -	
		7	Species in	Group 1				1	Species in	Group 2	

10	V _{DETRITUS}				sticks, or oth percent cove					er and	90.00 %
			Left	Side			Righ	t Side			
		100	95	95	90	100	95	90	85		
		100	90	80	65	100	85	95	75		
11	V _{HERB}	include woo	ody stems a percentage	t least 4" d	baceous veg bh and 36" t h 200% are	all. Because	e there may	be several l	ayers of gro	ound cover	Not Use
			Left	Side			Righ	t Side			
ampl	e Variable '	12 within the	e entire cat	chment of	the stream						
12	Vwluse	Weighted A	Average of F	Runoff Scor	e for waters	hed:					0.81
										o/ :	
			Land	Use (Choos	se From Dro	p List)			Runoff Score	% in Catch- ment	Running Percent (not >100
	Forest and r	native range (>75% ground	d cover)				-	1	35	35
	Forest and r	native range (50% to 75%	ground cove	r)			-	0.7	65	100
					1.1						
	-										
								•			
								-			
	Su	ummary					No	tes:	4	L	
V	ariable	Value	VSI		younger that						
Vc	CANOPY	96 %	1.00		Downstrea	am limits o	f some cha	innels have	been imp	acted by c	urrent
	MBED	1.8	0.40	work on p	onu.						
• E	UBSTRATE	0.08 in	0.04								
٧s											
	ERO	6 %	1.00								
VB		6 % 3.9	1.00 0.49								
V₀ V∟	WD	3.9	0.49								
V _B V _L V _T	WD DBH	3.9 9.1	0.49 1.00								
V⊧ V∟ V⊤ Vs	WD DBH NAG	3.9	0.49								
V _B V _L V _T V _S	WD DBH NAG SD	3.9 9.1 1.1 Not Used	0.49 1.00 1.00 Not Used								
V _B V _L V _T V _S V _S	WD DBH NAG	3.9 9.1 1.1	0.49 1.00 1.00								

												ion 1-25-11
High-Gradient Headwater Streams in eastern Kentucky and western West Virginia								а				
Field Data Sheet and Calculator												
	Team:	M. Thomay	er, P. Renn	er				l	_atitude/UTI	M Northing:	38.17447	
Pro	Project Name: Big Sandy Pond Closure Project Longitude/UTM Easting: -82.648223						}					
	Location: Lawrence County, Kentucky (Stream Habitat Area 7) Sampling Date: 6 June 2012											
SA	AR Number:			Length (ft):	225	Stream Ty	pe:	Ephe	meral Stream			•
	Top Strata:	Tre	e/Sapling St	rata	(determine	d from perce	ent cal	culate	ed in V _{CCANO}	PY)		
Site	and Timing:	Project Site				-	Before	Proje	ct			-
Sample	e Variables	1_1 in strop	m channal									
Sampio 1			ercent cover	ovor chann	al by trap a	od conling c		Mo	ocuro at po	fower than	10 roughly	
1		equidistant 20%, enter	points along at least one	g the strean value betw	n. Measure veen 0 and 1	only if tree/ 19 to trigger	sapling	g cove	er is at least			99.5 %
			measuremei				_					6
	100	100	95	100	100	100	10	00	100	100	100	
2	V _{EMBED}	along the s	tream. Sele	ect a particle	e from the b	ed. Before	moving	g it, de	etermine the	percentag		2.5
			d area surro o the followi									
			e of 1. If the								onto, 400 a	
			ness rating		-			-		ts, Megaha	n, and	
		Minshall 19	•	0,			,			<i>,</i> 3	,	
		Rating	Rating Des	cription								
		5	<5 percent	of surface of	overed, sur	rounded, or	buried	d by fi	ne sedimen	t (or bedroo	:k)	
		4	5 to 25 perc									
		3	26 to 50 pe									
		2	51 to 75 pe								ial aurifa a a)	
	list the roti	1	>75 percen		coverea, su	irrounded, c	or burie	ed by	nne seaime	nt (or aninc	ial sunace)	l
			point below		0	0		`	4	0	0	1
	2	3	2	1	2	3	2		1	2	2	
	2	3	2	3	2	3	2		3	2	2	
	2	3	3	2	4	3	4	ł	3	4	4	
		Madianat	ana ah sisi	l autration t	antial i:	Magazin				ala ha a su dati	tant nation	
3	V _{SUBSTRATE}		eam channe							gnly equidis	tant points	0.15 in
	_	-	tream; use t	-	-				-			
			ches to the				w (bed	Irock :	should be co	ounted as 9	9 in,	
			0.0 in, sand	-					_	_	_	1
	0.08	0.08	0.08	0.08	0.08	1.00	0.0		0.08	0.08	0.08	
	0.08	0.10	0.08	1.00	0.08	0.50	0.0		0.50	0.08	0.20	
	0.50	1.00	0.25	1.00	4.00	2.00	5.0	00	7.00	6.00	10.00	
4	V_{BERO}		nt of erodec									
		side and th may be up	e total perce to 200%.	entage will b	e calculate	d If both ba	nks ar	e ero	ded, total e	rosion for th	e stream	10 %
		-	Left Bank:	1 -	l ft		Right E	Rank [.]	12	2 ft		

Sampl	Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).										
5	V_{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount 3.1 3.1						3.1			
		per 100 lee	et of stream	will be calco		downed w	oody stems:		7		
6	V _{TDBH}	Average db	h of trees (measure on			ing cover is a	t least 20%	6). Trees ar	e at least 4	40.0
		inches (10	cm) in dian	neter. Enter	tree DBHs i	in inches.					12.0
				nents of indi	vidual trees	(at least 4	in) within the	buffer on e	each side of		
	-	the stream	Left Side					Right Side			
	8	10	12	12	17	9	12	15	13	6	
	14	5	9	11	12	7	16	11	10	14	
	12	16	11	10	14	13	15	10	18	12	
	13	12	15			9	13	15			
7	V _{SNAG}	Number of	snags (at le	ast 4" dbh a	and 36" tall)	per 100 fee	et of stream.	Enter num	ber of snag	s on each	
-	SINAG			d the amoun							2.7
			Left Side:		3		Right Side:		3		
8	V_{SSD}						hes dbh) per				Not Used
				tream will be			ubs on each s		stream, and	line	Not Used
		•	Left Side:				Right Side:				
9	V _{SRICH}						am reach. Cl				
							ive species p from these d		ili strata. Sp	Decles	2.67
			p 1 = 1.0						2 (-1.0)		
~	Acer rubr	um		Magnolia ti	ripetala		Ailanthus a	tissima		Lonicera ja	ponica
	Acer sace	charum		Nyssa sylv	atica		Albizia julib	rissin		Lonicera ta	ntarica
	Aesculus	flava		Oxydendrun			Alliaria petie			Lotus corn	iculatus
	Asimina t		~	Prunus ser			Alternanthe			Lythrum sa	
		ghaniensis	~	Quercus al			philoxeroides			Microstegiur	
	Betula ler			Quercus co		Aster tataricus				Paulownia	
_	Carya alb			Quercus in			Cerastium f			Polygonum	
	-						Coronilla va			Pueraria m	
	Carya gla			Quercus pi							
	Carya ova			Quercus ru			Elaeagnus ui			Rosa multi	
✓ 	Carya ova			Quercus ve			Lespedeza			Sorghum h	-
✓	Cornus fle			Sassafras			Lespedeza			Verbena bi	rasiliensis
	Fagus gra	andifolia		Tilia amerio			Ligustrum ob	tusifolium			
	Fraxinus	americana		Tsuga can			Ligustrum s	inense			
	Liriodendro	on tulipifera		Ulmus ame	ericana						
	Magnolia	acuminata									
		6	Species in	Group 1				0	Species in	Group 2	
		0	-p00100 III					5	000000111	210up 2	

	Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each										
-					-	-		arian/buffer f the stream.		n 25 feet fro	om each
10	V _{DETRITUS}	Average pe	ercent cover	r of leaves, s	sticks, or oth	her organic i	material. W	Voody debris	s <4" diamet	ter and	96.88 %
	<36" long are include. Enter the percent cover of the detrital layer at each subplot.]						
		95	100	100	100	100	100	90	100	1	
11	\/	100 Average pe	100 ercentage.cc	90 over of berb	95	100	100 asure only if	85	95	Do not	
11	V _{HERB}							if tree cover i / be several la			Not Used
		vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation									NOT USED
		at each sub		Side		<u> </u>	Righ	nt Side		1	
										1	
Sample 12	e Variable 1	12 within the			the stream.						1
12	V WLUSE	Weightee.	Werage c.		5101 Waters						1.00
			Lond		Dro	1:-4)			Runoff	% in	Running
			Lanu	Use (Choos	se From Dro	p List)		ļ	Score	Catch- ment	Percent (not >100)
	Forest and r	native range (:	>75% ground	d cover)				•	1	100	100
	·							•			
	P							•			
l l	·							-			
								•			
l l								•			
l								•			
l											
	Su	ummary					Nc	otes:			
V	ariable	Value	VSI	Streams a	are within m	nature upla	and forest.				
Vc	CANOPY	100 %	1.00								
VE	MBED	2.5	0.65								
Vs	UBSTRATE	0.15 in	0.08								
VB	ERO	10 %	1.00								
VL	WD	3.1	0.39								
VT	DBH	12.0	1.00								
Vs	NAG	2.7	1.00								
Vs	SD	Not Used	Not Used								
Vs	RICH	2.67	1.00								
VD	ETRITUS	96.9 %	1.00								
V _H	ERB	Not Used	Not Used								

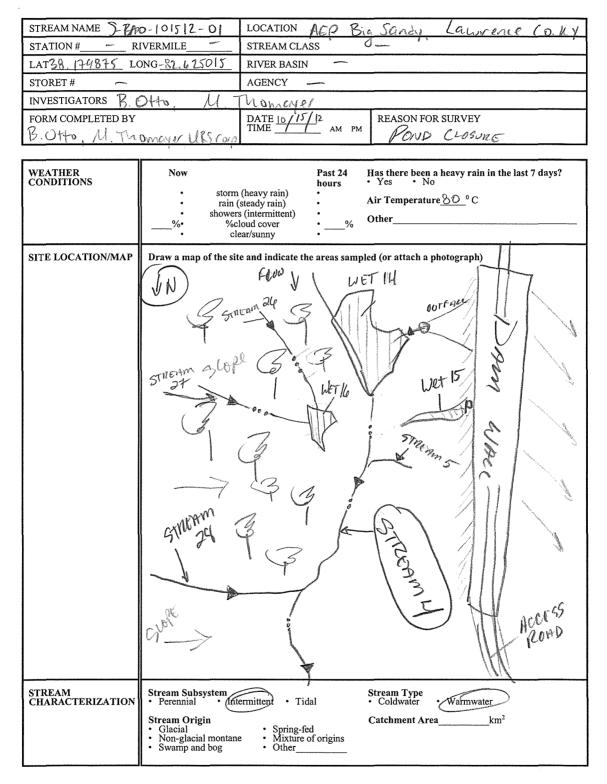


APPENDIX D

U.S. EPA RAPID BIOASSESSMENT STREAM FORMS



PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse · Forest · Commercial · FieldPasture · Industrial · Agricultural · Other · Residential · Other	Local Watershed NPS-Pollution • No evidence • Some potential sources • Obvious sources Local Watershed Erosion • None • Moderate • Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant Trees dominant species present OAL-MA	
INSTREAM FEATURES	Estimated Reach Lengthm Estimated Stream Width $/ \not{H}_{+}_{+}_{+}_{+}_{+}_{-}_{-}_{-}_{-}_{-}_{-}_{-}_{-}_{-}_{-$	Canopy Cover • Partly open Partly shaded • Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types • Riffle % • Run % • Pool% Channelized • Yes • No Dam Present • Yes • No
LARGE WOODY DEBRIS NONE	LWDm ² Density of LWDm ² /km ² (LWD/ reac	h area)
AQUATIC VEGETATION NONE	Indicate the dominant type and record the dominant • Rooted emergent • Rooted submergent • Floating Algae • Attached Algae dominant species present	Rooted floating Free floating
WATER QUALITY AMD IMPACTÉ	Temperatureº C Specific Conductance)Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors • Normal/None • Sewage • Petroleum • Chemical • Fishy • Other • Slick • Sheen • Globs • Slick • Sheen • Globs • Flecks • None • Other • Other • Other • Clear • Slightly turbid • Other • Other
SEDIMENT/ SUBSTRATE	Odors • Petroleum • Normal • Sewage • Petroleum • Chemical • Anaerobic • None • Other Anaerobic • None Oils • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes • No

INC	ORGANIC SUBSTRATE (should add up to		ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)			
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area	
Bedrock			Detritus	sticks, wood, coarse plant	20	
Boulder	> 256 mm (10")			materials (CPOM)		
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic		
Gravel	2-64 mm (0.1"-2.5")	40		(FPOM)		
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments		
Silt	0.004-0.06 mm	30]			
Clay	< 0.004 mm (slick)					

Stream 4 5-BAD: D1512-01

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME 5- 640-101512-01	LOCATION BIG SANDY DOND CLOSURG SUTE
STATION # RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS BAD, MDT	
FORM COMPLETED BY	DATE 1/15/12 REASON FOR SURVEY
BAD NOT	TIME AM ON POND CLOSURE

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
each	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 🔞 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
uate	SCORE / 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
rs to be eval	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
mete	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Para	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 🕢 6	5 4 3 2 1 0

39

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabio or cement; over 80% of the stream reach channelized and disrupte Instream habitat greatly altered or removed entirely.
	SCORE 14	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
pung reacn	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
ı sam	SCORE 12	20 19 18 17 16	15 14 13 1 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e ev:	SCORE (LB)	Left Bank 10 9	8 7 6	5 🧿 3	2 1 0
to b	SCORE (RB)	Right Bank 10 9	8 7 6	5 42 3	2 1 0
rarameter	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambani vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE 🗽 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone - meters: little or no riparian vegetation due human activities.
	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE 🤦 (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0

Total Score <u>103</u>

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BAD-0000310-04	LOCATION AEP BIG SANDY, LAWRENCE CO. KY						
STATION # RIVERMILE	STREAM CLASS —						
LAT 38, 185593 LONG - 87. 648905	RIVER BASIN —						
STORET #	AGENCY						
INVESTIGATORS B. OTTO, M. THOMA	INVESTIGATORS B. OTTO, M. THOMRYER /1						
FORM COMPLETED BY B. OTTO, M. THOMAYON, URS CORP	DATE 050312 TIME 2935 AD PM REASON FOR SURVEY POND CLOSUNE						

WEATHER CONDITIONS	Now Past 24 hours Has there been a heavy rain in the last 7 days? • storm (heavy rain) • Yes • No • rain (steady rain) • Air Temperature \mathcal{N}^0 C • %• % cloud cover • % • %• % cloud cover • % • %• % cloud cover • %
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 4 5 $-64 \times 05^{13/2}$ 0 4 $5 \times 10^{-} - 0^{-1}$ $5 \cdot 10^{-} - 0^{-}$ $5 \cdot 10^{-} - 0^{$
	HURSEFORD COEFEK
	19 3 3 G FWASH
STREAM CHARACTERIZATION	Stream Subsystem • Tidal Stream Type • Perennial • Intermitten • Tidal Stream Origin • Spring-fed • Coldwater • Glacial • Spring-fed • Mixture of origins • Non-glacial montane • Mixture of origins • Other • Swamp and bog • Other 510000

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES RIPARIAN VEGETATION	Predominant Surrounding Landuse Eorest Commercial Field/Pasture Industrial Agricultural Other Residential Indicate the dominant type and record the dominant Trees Shrubs	Local Watershed NPS Pollution • No evidence • Some potential sources • Obvious sources Local Watershed Erosion • None • Moderate • Heavy ant species present Grasses • Herbaceous
(18 meter buffer)	dominant species present <u>MIXED MES</u> -	
INSTREAM FEATURES	Estimated Reach Length 815 rd $F4$, Estimated Stream Width 2 yd $F4$, Sampling Reach Area 815 rg $F4$, Area in km ² (m ² x1000) km ² Estimated Stream Depth $4/$ rd / μ . M/PD Surface Velocitym/sec (at thalweg)	Canopy Cover • Partly open • Partly shaded Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types • Riffle 80 % • Run % • Pool 20 % Channelized • Yes No Dam Present • Yes No
LARGE WOODY DEBRIS	LWDm ² THENE 15 A L Density of LWDm ² /km ² (LWD/ reac	OT OF WODDY DEBUB harea)
AQUATIC VEGETATION	Indicate the dominant type and record the dominant • Rooted emergent • Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors Normal/None Petroleum Chemical Fishy Other Water Surface Oils Slick Sheen Slick Sheen None Other Turbidity (if not measured) Clear Slightly turbid Opaque Stained
SEDIMENT/ SUBSTRATE	Odors • Sewage • Petroleum • Chemical • Anaerobic • None • Other • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	>256 mm (10")	30			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	16			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	35			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-13AD-050312-04	LOCATION AEP BIGS.	ANDY, LAWRENCE CO. KU			
STATION # RIVERMILE	STREAM CLASS				
LAT 38.195593 LONG-53.64 89 05	RIVER BASIN —				
STORET #	AGENCY				
INVESTIGATORS B. O XTO, M. THOM RUEN	, U1S				
FORM COMPLETED BY	DATE <u>6703/2</u> TIME <u>6930</u> M pm	REASON FOR SURVEY			

	Habitat		Condition	a Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score Q	20 19 18 17 16	15 14 13 12 11	10 9 8 7 🐼	5 4 3 2 1 0
sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
Iram	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
P	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 🛞 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
H	SCORE S	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

		Habitat		Condition	Category	
		Parameter	Optimal	Suboptimal	Marginal	Poor
		6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
20		score 20	20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	ing reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
/0	sampl	score /D	20 19 18 17 16		19 8 7 6	5 4 3 2 1 0
	Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
le	e eva	SCORE <u>3</u> (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
	s to b	SCORE $\underline{\mathcal{3}}$ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	Rarameters	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
		SCORE $\frac{4}{6}$ (LB)	Left Bank 10 9	<u>(8</u> 7 6	5 4 3	2 1 0
		SCORE <u>(</u> (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
	18	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
		SCORE $\frac{Q}{Q}$ (LB)	Left Bank 10 (¹ 9)	8 7 6	5 4 3	2 1 0
10		SCORE (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0

Total Score <u>96</u>

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME 5-3AD-050412-0つ	LOCATION AEP BIG SANDY, LAWRENCE CO. KU		
STATION # RIVERMILE	STREAM CLASS		
LAT 38.17461 LONG -82.642901	RIVER BASIN		
STORET #	AGENCY		
INVESTIGATORS B. OTTO, M. THOMAYEN	R		
FORM COMPLETED BY	DATE 05/04/12 REASON FOR SURVEY		
BOTTO	POND CLOSUNE		

WEATHER CONDITIONS	Now Past 24 hours Has there been a heavy rain in the last 7 days? • atorm (heavy rain) • • rain (steady rain) • • showers (intermittent) • % %cloud cover • • clear/sunny •
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) V = bho = 050(h) = 02 F = bho = 050(h) = 02 F = 050(h) = 0
	EP 2007 P
STREAM CHARACTERIZATION	Stream Subsystem • Tidal Stream Type • Perennial • Intermittent • Tidal Stream Origin • Coldwater • Warmwater • Glacial • Spring-fed • Mixture of origins • Non-glacial montane • Mixture of origins • Other • Swamp and bog • Other \$Lock

Stream 15 5-BAD-050412-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES RIPARIAN VEGETATION (18 meter buffer)	Predominant Surrounding Landuse Forest • Commercial • Forest • Industrial • Field/Pasture • Industrial • Agricultural • Other • Residential • Other Indiceste the dominant type and record the domin • Trees • Shrubs • dominant species present Miceo MES –	• None • Moderate • Heavy
INSTREAM FEATURES	Estimated Reach Length $\frac{594}{m}$ Estimated Stream Width 3 vi \in $+$. Sampling Reach Area m^2 Area in km ² (m ² x1000) $-$ km ² Estimated Stream Depth 4 vi a , Ave . Surface Velocity m/sec (g in MPD	Canopy Cover • Partly open • Partly shaded • Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types
LARGE WOODY DEBRIS	LWDm ² Density of LWDm ² /km ² (LWD/ reac	
AQUATIC VEGETATION	Indicate the dominant type and record the domin Rooted emergent Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors • Normal/Name Sewage • Petroleum • Chemical • Fishy • Other
SEDIMENT/ SUBSTRATE	Odors • Sewage • Petroleum • Chemical • Anaerobic • None • Other • Oils • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes • No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach			% Composition in Sampling Area
Bedrock		5	Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")	15		materials (CPOM)	
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic	**************************************
Gravel	2-64 mm (0.1"-2.5")	30		(FPOM)	
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm]		
Clay	< 0.004 mm (slick)	20			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-B40-050412-02	LOCATION AEP BIGS	SANDY, LAWRENCE KY
STATION # RIVERMILE	STREAM CLASS	/
LAT 38. 185593 LONG - 82. 648905	RIVER BASIN -	
STORET #	AGENCY -	
INVESTIGATORS B. OTTO, M. THOMAYE	C	
FORM COMPLETED BY	DATE <u>0504/2</u> TIME <u>0900</u> Ø рм	REASON FOR SURVEY

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 13	20 19 18 17 16	14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	SCORE L	20 19 18 17 16	15 14 (13/ 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth All four velocity/depth Regime regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is		Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
Iram	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	3 4 3 2 1 0
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status 15	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Ttobiant		Condition	Category	
	Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score 15	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
ng reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
samp	SCORE / ()	20 19 (18/ 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e evs	SCORE (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
s to b	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Parameters 1	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE $\frac{Q}{Q}$ (LB)	Left Bank 10	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10 🕥	8 7 6	5 4 3	2 1 0

Total Score <u>144</u>

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-BA	D-051512-A2	LOCATION	ALD BU	SANDU	LAWRENCE.	KV
	VERMILE	STREAM CLA	SS -		<u></u>	· / · · · ·
LAT 38.18225 LO	NG - 82. 648104	RIVER BASIN	*****			
STORET #		AGENCY				
INVESTIGATORS BO	TTO M. THOWAYERE	2				
FORM COMPLETED BY B. 0170, M. TA		DATE <u>05/15</u> TIME /4/40	- AM (M	2 0	DR SURVEY D CLOGUNE	-
WEATHER CONDITIONS	• rain (s • showers %• %clc	heavy rain) teady rain) (intermittent) ud cover n/Sunny	Past 24 hours • • • • •	Has there beer Yes • N Air Temperatu Other	n a heavy rain in th lo ure 🔀 º C	e last 7 days?
SITE LOCATION/MAP	Draw a map of the site	Lever J J Jipeu	G, G	STORE H S-MOT-C	Wordpee Groes I	
STREAM CHARACTERIZATION	Stream Subsystem • Perennial Inter Stream Origin • Glacial • Non-glacial montane • Swamp and bog	• Spring-fe • Mixture o • Other	d	Stream Type • Coldwater Catchment Ar	•Warmwater reakm ²	

Stream 18 S-BAD-051512-02

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse • Commercial • Field/Pasture • Industrial • Agricultural • Other • Residential	Local watersned Erosion
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the domin Trees Shrubs dominant species present <u>Sycamone</u> , 7	• None • Moderate • Heavy ant species present Grasses • Herbaceous Sup Popular, Bucktyr
INSTREAM FEATURES	Estimated Reach Length $\frac{1}{20}$ M F4 Estimated Stream Width 2.5 pt F4. Sampling Reach Aream ² Area in km ² (m ² x1000)km ² Estimated Stream Depthkm_2 MPD Surface Velocitym/sec (at thalweg)	Canopy Cover • Partly open • Partly shaded Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types
LARGE WOODY DEBRIS	LWD m ² Density موجلا m ² /km ² (LWD/ reac	h area)
AQUATIC VEGETATION	Indicate the dominant type and record the domin • Rooted emergent • Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water_Odors • Normal/Alone • Sewage • Petroleum • Chemical • Fishy • Other Water Surface Oils • Globs • Flecks • Slick • Sheen • Globs • Flecks • None • Other Turbidity (if not measured) • Clear • Slightly turbid • Clear • Slightly turbid • Other
SEDIMENT/ SUBSTRATE	Odors. • Normal • Sewage • Petroleum • Chemical • Anaerobic • None • Other Oils • Absent • Slight • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes • No
INORGANIC SUB		RGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

(should add up to 100%)			(does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	Detritus sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	20			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic	· · · · · · · · · · · · · · · · · · ·
Gravel	2-64 mm (0.1"-2.5")	20		(FPOM)	
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	/0 ,]		
Clay	< 0.004 mm (slick)	30]		

Stream 18 5-BAD-651512-02

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME S-BI	40.0131512-02	LOCATION AEP BIG SA	NOU, LAWRONCE, Key	/
STATION # R	RIVERMILE	STREAM CLASS —	1' /	
LATL	ONG	RIVER BASIN		
STORET #		AGENCY		
INVESTIGATORS B.	OTTO, M. THOMA	yer, URS		
FORM COMPLETED BY B. GT70		DATE <u>05/57</u> TIME ам рм	REASON FOR SURVEY	

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score /0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
ı sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	SCORE ()	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
ram	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 🌀	5 4 3 2 1 0
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
B	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	score V	20 19 18 17 16	15 14 13 12 11	10 9 🛞 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score /	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
oling reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
samp	SCORE /O	20 19 18 17 16	15 14 13 12 11	1 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
oe ev	SCORE <u>}</u> (LB)	Left Bank 10 9	8 🕜 6	5 4 3	2 1 0
s to l	SCORE <u></u> (RB)	Right Bank 10 9	8 🕖 6	5 4 3	2 1 0
Parameter	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE $\frac{7}{4}$ (LB)	Left Bank 10 9	8 ((7) 6	5 4 3	2 1 0
	SCORE / (RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE $\frac{1}{a}$ (LB)	Left Bank 10 😡	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0

Total Score <u>112</u>

Stream 24 5-BAD-050410-04

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-1340-05 2412 -04	LOCATION AEP BIG SANDY. LAWRENCE COLLY
STATION # RIVERMILE	STREAM CLASS
LAT 38. 182538 LONG -82.636175	RIVER BASIN —
STORET#	AGENCY
INVESTIGATORS B. OTTO, M. THOMAN	ion, Uns corp
FORM COMPLETED BY	DATE CS/24/12 REASON FOR SURVEY TIME AM PM POHOCLOSUNE

WEATHER CONDITIONS	Now 	storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover ctear/sunny	Past 24 hours • • • • • •	Has there been a heavy rain in the last 7 days? • Yes <u>No</u> Air Temperature <u>9</u> ° C Other
SITE LOCATION/MAP	Draw a map			pled (or attach a photograph) 50412-04 V Scope V Scope V V V V Scope P V Scope P V Scope P V Scope P V Scope P V Scope P P P P P P P P P P P P P
STREAM CHARACTERIZATION	Stream Subs • Perennial Stream Orig • Glacial • Non-glacia • Swamp and	• Intermittent • Tid gin • Spring-fi • Mixture	dal	Stream Type • Coldwater • Warnwater Catchment Areakm ²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse Eorest Commercial Field/Pasture Industrial Agricultural Residential Indicate the dominant ture and record the domin	Local Watershed NPS Pollution No evidence Some potential sources Obvious sources Local Watershed Erosion None Moderate Heavy 	
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the domin • Trees • Shrubs • Shrubs		
INSTREAM FEATURES	Estimated Reach Length 77% m Estimated Stream Width $1 m^2 + 5\%$ Sampling Reach Area m^2 Area in km ² (m ² x1000) km ² Estimated Stream Depth $0 m m^2$ Surface Velocity m/sec (at thalweg)	Canopy Cover • Partly open • Partly shaded • Shaded High-Water-Markm Proportion of Reach Represented by Stream Morphology Types • Riffle % • Run % www • Pool % • No www Channelized • Yes No Dam Present • Yes No	
LARGE WOODY DEBRIS	LWD m ² Density of LWD m ² /km ² (LWD/ reac	h area)	
AQUATIC VEGETATION NO FLOW	Indicate the dominant type and record the dominant species present • Rooted emergent • Rooted submergent • Rooted floating • Free floating • Floating Algae • Attached Algae • Rooted floating • Free floating dominant species present		
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors • Notmal/None • Sewage • Petroletum • Chemical • Fishy • Other Water Surface Oils • Globs • Flecks • Slick • Sheen • Globs • Flecks • None • Other Turbidity (if not measured) • Clear • Slightly turbid • Turbid • Opaque • Stained • Other	
SEDIMENT/ SUBSTRATE	Odors • Sewage • Petroleum • Chemical • Anaerobic • None • Other • Other • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		50	Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	20		(FPOM)	
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	10]		
Clay	< 0.004 mm (slick)				

Stream 24 S-BAD 050412-04

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME 5- BAD-05242-04	LOCATION AEP BK	SANDY, LAWRENCE CO., KY
STATION # RIVERMILE	STREAM CLASS 🛌	///
LAT 38.182538 LONG-82.636175	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS B. OTTO, M. THOMAYER		
FORM COMPLETED BY	DATE 0724/2	REASON FOR SURVEY
B.OTTO	TIME His AM PM	

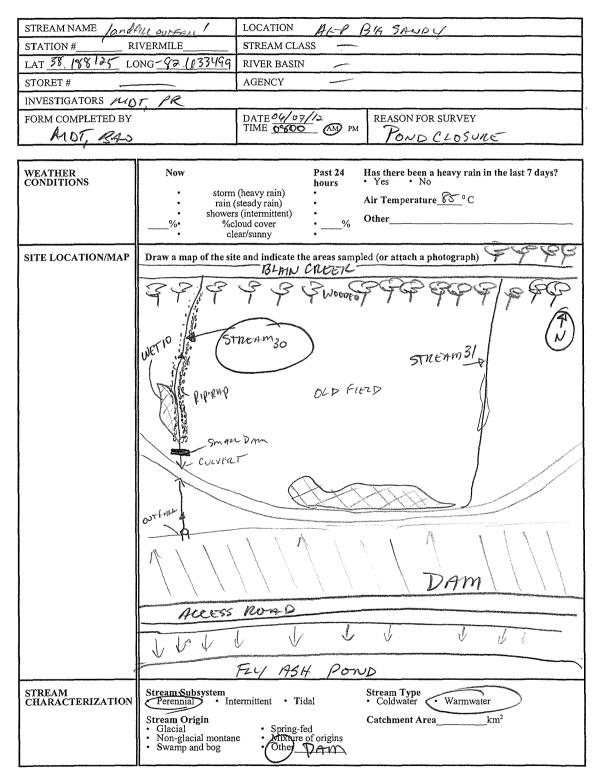
	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score ((20 19 18 17 16	15 14 13 12 🛈	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	score B	20 19 18 17 16	15 14 13 12 11	10 9 🕭 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
Iram	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 🏠 Ó
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score 0	20 19 18 17 16	15 14 13 12 11	10 9 🔇 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
28	score (/	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 🛈

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score /O	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
ling reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
samp	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e eva	SCORE <u>(LB</u>)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
s to b	SCORE (RB)	Right Bank 10 9	8 7	5 4 3	2 1 0
Parameter	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	score <u>7</u> (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
	SCORE 5_(RB)	Right Bank 10 9	8 7 6	5 4 🕏	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
R					

Total Score

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES RIPARIAN VEGETATION (18 meter buffer)	Predominant Surrounding Landuse Forest • Commercial FieldPasture • Industrial • Agricultural • Other Dramm • Residential • Fifther Powo Indicate the dominant type and record the dominant species present • Shrubs	Local Watershed Erosion None Moderate · Heavy ant species present Grassee · Herbaceous
INSTREAM FEATURES	Estimated Reach Length	Canopy Cover Partly open · Partly shaded · Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types · Riffle0 % · Run% · Pool% Channelized · Yes · No Dam Present Yes · No
LARGE WOODY DEBRIS NONE AQUATIC VEGETATION	LWDm ² Density of LWDm ² /km ² (LWD/ reac Indicate the dominant type and record the domina • Rooted submergent • Floating Algae dominant species presentSuperFu- Portion of the reach with aquatic vegetation _/_	ant species present • Rooted floating • Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors
SEDIMENT/ SUBSTRATE	Odors · Sewage · Petroleum · Chemical · Anaerobic · None · Other · Oils · Absent · Slight · Moderate · Profuse	Deposits Sludge · Sawdust · Paper fiber · Sand · Relict shells · Other Looking at stones which are not deeply embedded, are the undersides black in color? · Yes No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)			
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")	10	1	materials (CPOM)	
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	25		(FPOM)	
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	25	7		
Clay	< 0.004 mm (slick)				

RIP-RAPON BANKS & SUBSTRATE

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STR. 3-0	LOCATION AEP BIG SANOU		
STATION # RIVERMILE	STREAM CLASS		
LAT LONG	RIVER BASIN		
STORET #	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY	DATE REASON FOR SURVEY TIME AM PM POND CLOSINE		

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score ^[]	20 19 18 17 16	15 14 13 12 (17)	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ed iı	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
ıram	SCORE l	20 19 18 17 16	15 14 13 12 11	10 9 8 🕤 6	5 4 3 2 1 0
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score (4	20 19 18 17 16	15 (4) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Мł	SCORE IV	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0

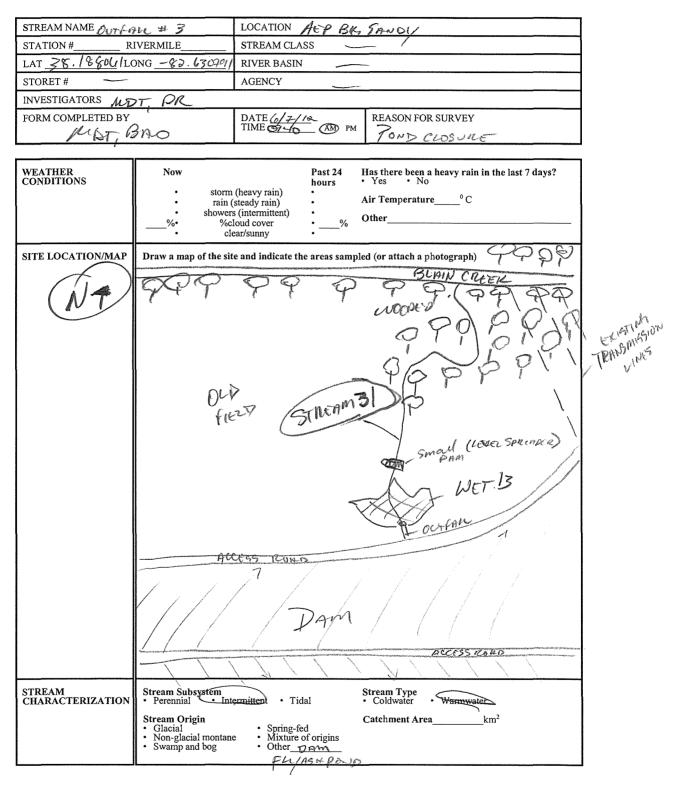
HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabio or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0
0	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water of shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
A at analog to be etalgated at baset than sampling to be	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing 60-100% of bank has erosional scars.
5	SCORE (LB)	Left Bank 10 🔊	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streamban vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
İ	SCORE (LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
	SCORE U (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone meters: little or no riparian vegetation due human activities.
)	bank riparian zone)	impacted zone.			
	SCORE (LB)	impacted zone. Left Bank 10 9	8 7 6	5 4 3	2 (0 0

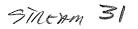
Total Score ______

Ц١

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1



PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

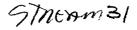
WATERSHED FEATURES RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant	Local Watershed Erosion • None • Moderate • Heavy ant species present Grasses
(18 meter buffer) INSTREAM FEATURES	dominant species present	Canopy Cover Partly open • Partly shaded • Shaded High Water Markm Proportion of Reach Represented by Stream Morphology Types • Riffle% • Run0% • Pool% Channelized • No
LARGE WOODY DEBRIS WINE	(at thalweg) LWD Density-of LWD m ² /km ² (LWD/ reac	Dam Present • No
AQUATIC VEGETATION	Indicate the dominant type and record the domin Rooted submergent Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water-Odors • Normal/None • Sewage • Petroleum • Chemical • Fishy • Other Water Surface Oils • Slick • Sheen • Globs • Flecks • Slick • Sheen • Globs • Flecks • None • Other Turbidity (if not measured) • Clear • Slightly turbid • Turbid • Opaque • Stained • Other • Other
SEDIMENT/ SUBSTRATE	Odors Normal · Sewage · Petroleum · Chemical · Anaerobic · None · Other Oils Absent · Slight · Moderate · Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes • No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")			materials (CPOM)	20
Cobble	64-256 mm (2.5"-10")	P	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	30		(FPOM)	
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	40]		
Clay	< 0.004 mm (slick)]		

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STREAM 31	LOCATION AEP BIGSHAUDU
STATION # RIVERMILE	STREAM CLASS
LAT 39, 188001 LONG -82. (030791	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE $2667/2$ REASON FOR SURVEY TIME $AM PM$ $Por D Chosine$

	Habitat	Condition Category			
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score 9	20 19 18 17 16	15 14 13 12 11	10 🔊 8 7 6	5 4 3 2 1 0
n sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 🚯 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
Iram	score 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
P.	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	Ø 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0



	Habitat	Condition Category				
	Parameter	Optimal	Suboptimal	Marginal	Poor	
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabio or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
	SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 (1) 0	
ling reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water o shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.	
samp	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	3 4 3 2 1 0	
to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.	
e ev:	SCORE 6 (LB)	Left Bank 10 9	8 7 🔊	5 4 3	2 1 0	
to b	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0	
Parameters	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
12	1	Left Bank 10 9	8 7 6	5 4 3	2 1 0	
	SCORE (2 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0	
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone meters: little or no riparian vegetation due t human activities.	
10	SCORE (LD)	Left Bank 10 9	. 8 7 6	(5) 4 3	2 1 0	
	SCORE (RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0	

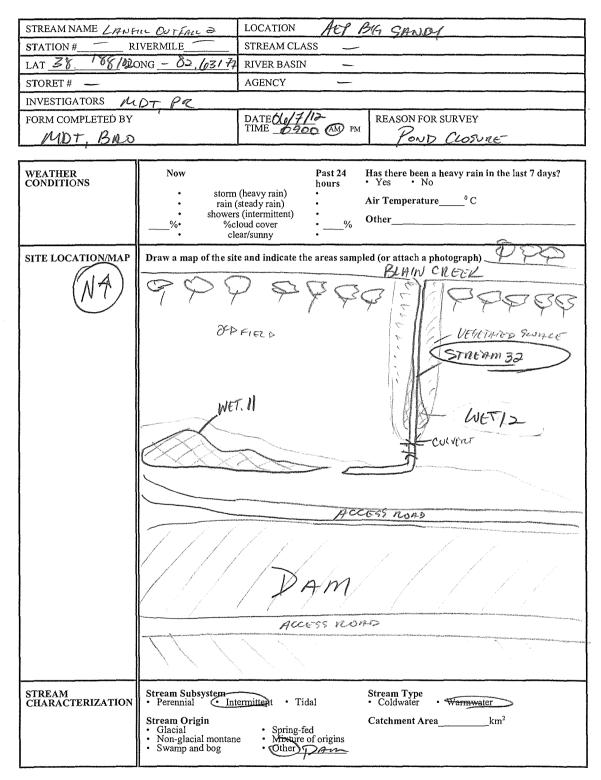
HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS (BACK)

Total Score

57

landfill adtall 2 Stream 32

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES RIPARIAN		Local Watershed NPS Pollution • No evidence • Some potential sources • Obvious sources Local Watershed Erosion • None • Moderate • Heavy
VEGETATION (18 meter buffer)	Indicate the dominant type and record the domina • Trees • Shrubs dominant species present	Grassee Herbaceous Noc., Montry Wart 20
INSTREAM FEATURES	Estimated Reach Length m^{-1} Estimated Stream Width $5 m^{-1}$ Sampling Reach Area m^{2} Area in km ² (m ² x1000) km ² Estimated Stream Depth $m^{-1} k_{0}$, Surface Velocity m/sec (at thalweg)	Canopy Cover Partly shaded • Shaded Partly open Partly shaded • Shaded High Water Mark m Proportion of Reach Represented by Stream Morphology Types • Riffle % • Run % Pool % Channelized Yes • No Dam Present Yes • No
LARGE WOODY DEBRIS NONE	LWDm ² Density of LWDm ² /km ² (LWD/ reach	1 area)
AQUATIC VEGETATION	Indicate the dominant type and record the dominan • Rooted emergent • Floating Algae dominant species present Portion of the reach with aquatic vegetation	• Rooted floating • Free floating
WATER QUALITY	Temperature0 C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors Normal/None Sewage · Petroleum · Chemical · Fishy · Other Water Surface Oils · Slick · Sheen · Globs · Flecks · Slick · Sheen · Globs · Flecks · Turbidity (if not measured) · Clear · Slightly turbid · Opaque · Stained · Turbid
SEDIMENT/ SUBSTRATE	Odors Normal · Sewage · Petroleum · Chemical · Anaerobic · None · Other Oils · Absent · Slight · Moderate · Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")			materials (CPOM)	30
Cobble	64-256 mm (2.5"-10")	20	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	HO		(FPOM)	
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	/0			
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS (FRONT)

STREAM NAME MILEAM 31	LOCATION AEP BIGSANDY
STATION # RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY MDT, BAD	DATE 0407/10 REASON FOR SURVEY TIME 0900 MPM PONDCLOSURE

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	score +	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
ı sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ed in	score <i>F</i>	20 19 18 17 16	15 14 13 12 11	10 9 8 🖓 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
ram	score 🧿	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE U	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 🛈

)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabior or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 🛈 0
ng reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water o shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
ampli	score O	obstruction is important.2019181716	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over, 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e eva	SCORE <u></u> (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
to b	SCORE 4 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces . covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
ť٥	SCORE $\frac{1}{5}$ (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
	SCORE (RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0
ó	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone < meters: little or no riparian vegetation due t human activities.
J	$\text{SCORE} \frac{4}{4} \text{(LB)}$	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
	SCORE (RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET-HIGH GRADIENT STREAMS (BACK)

Total Score 62

Stream 44 5-nd + 5/15/2012 - 7 PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

(FRONT)					
STREAM NAME 5-Md +5	1 1 11 1041		Ria Sala	1. Plante Laura	ne la UV
	VERMILE	LOCATION Bis Sandy Plant; Lawrence Co KY STREAM CLASS			
LAT <u>38./8353</u> LO		RIVER BASIN			<u></u>
STORET #		AGENCY			
INVESTIGATORS 4.7	Thomas et. B. Ott	<u></u>			
FORM COMPLETED BY	Monard CI, D. On	DATE 15 May TIME 1713	- 2012 AM . #M	REASON FOR SURV	ΈY
M.Thomayer B.Otto	; URS Carp	111112 <u>7 11.3</u>		Landfill	
WEATHER CONDITIONS	Now		Past 24	Has there been a heavy • Yes • No	rain in the last 7 days?
CONDITIONS	• storm	(heavy rain)	hours •	Air Temperature	
	 rain (showers 	steady rain) (intermittent)	•	_	C
	%• %c	oud cover	•%	Other	
	2				·
SITE LOCATION/MAP	Draw a map of the sit	e and indicate th	e areas samp	led (or attach a photogra	iph)
	year	:	2		
	1 9 H		The C	2.	SY N-
	2015	``````````````````````````````````````	3 5	r 5) *(
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Sere also		CIP	\mathcal{N}	S ST	
CLIPA			0		Flay Ksh,
several photos were also taken			(r •	fell ford
STREAM	Stream Subsystem Perennial • Int	ermittent • Tic		Stream Type • Coldwater • Wari	mitratar
CHARACTERIZATION			ia1	Coldwater warn	km ²
	Stream Origin Glacial Non glacial montant 	• Spring-fe	d af origing	Catchment Area	KIII
	 Non-glacial montane Swamp and bog 	• Mixture • Other	<u>slope</u>		
			/		

Stream 49 5-MH 5/15/2012-7 PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse Foresp · Commercial · Field/Pasture · Industrial · Agricultural · Other · Residential	Local Watershed NPS Pollution Norevidence • Some potential sources • Obvious sources Local Watershed Erosion • None • Moderate • Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the domina Dress Shrubs dominant species present <u>Mred Mes</u> - ca	ant species present Grasses · Herbaceous all-maple - hich - beech
INSTREAM FEATURES	Estimated Reach Length $2,379$ of 4^{4} Estimated Stream Width $2-12$ of 4^{4} Sampling Reach Area m^{2} Area in km ² (m ² x1000) km^{2} Estimated Stream Depth $6^{\prime\prime}$ of μ pd Surface Velocity m/sec (at thalweg)	Canopy Cover • Partly open • Partly shaded • Shaded High Water Mark the foot Proportion of Reach Represented by Stream Morphology Types • Riffle % • Run % • Pool % Channelized • Yes • No Dam Present • Yes • No
LARGE WOODY DEBRIS	LWD m² Is of a Density of LWD m²/km² (LWD/ reach	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant • Rooted emergent • Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature ⁰ C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used	Water Odors . Normal/None · Sewage · Petroleum · Chemical · Fishy · Other Water Surface Oils . Other Water Surface Oils · Other Water Surface Oils · Other Turbidity (if not measured) · Clear < Slightly-turbid · Turbid
SEDIMENT/ SUBSTRATE	Odors • Normal • Sewage • Petroleum • Chemical • Anaerobic • None • Other Oils • Absent • Slight • Moderate • Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand> • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)			
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area	
Bedrock		15	Detritus			
Boulder	> 256 mm (10")	15	materials (CPOM)			
Cobble	64-256 mm (2.5"-10")	40	Muck-Mud black, very fine organic			
Gravel	2-64 mm (0.1"-2.5")	15		(FPOM)		
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments		
Silt	0.004-0.06 mm	5]			
Clay	< 0.004 mm (slick)]			

Stram 44 5-Ndt5/15/2012-7 HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME 3- nd+ 5/15/12-7 Horseforder	LOCATION Bis Sandy Plant: Lawrence Co., KY
STATION # RIVERMILE	STREAM CLASS
LAT 38. 18353 LONG -82. 65/65	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS U. Thomaser, B. Otto	
FORM COMPLETED BY M. Thomasec, B. CHO; URS	DATE <u>15/lay 2012</u> REASON FOR SURVEY TIME <u>17/13</u> AM CON Landfill

	Habitat	Condition Category					
	Parameter	Optimal	Suboptimal	Marginal	Poor		
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.		
	score 17	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
ı sampling reach	2. Embeddedness boulder particles are 0- 25% surrounded by fine		Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.		
ted ir	score 17	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).		
Iram	score 1/	20 19 18 17 16	15 14 13 12 🕖	10 9 8 7 6	5 4 3 2 1 0		
Par	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.		
	SCORE 15	20 19 18 17 16	13 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.		
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		



Stream 49 5-mdt5/15/2012-7 HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score 17	20 19 18 🕖 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
g reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
samp	score /B	20 19 🔊 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e eva	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
to b	SCORE <u>[</u> (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Parameters	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE <u>2</u> (RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
-	SCORE $\frac{0}{2}$ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
B	SCORE (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0

Total Score 142

Stream 68 5-pr 6/06/2012-2_ PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET SHEET (FRONT)

STREAM NAME 3- pr 6	166ho12-2	LOCATION	Sig Sano	4 Plant, Lowrence Co, Ky
	IVÉRMILE	STREAM CLASS		
LAT <u>38.17564</u> LO	ONG <u>-82-64765</u>	RIVER BASIN		
STORET #		AGENCY		
INVESTIGATORS M.7	hones, B. OHC	}		
FORM COMPLETED BY <u>H.Thomayer</u> B. Otto	, URS Carp	DATE <u>6 Jone</u> TIME <u>72.27</u>	ZOIZ AM (PM)	reason for survey band fill
WEATHER CONDITIONS	Now storm	(heavy rain)	hours	Has there been a heavy rain in the last 7 days? • Yes
	• rain (• shower %• %c	steady rain) s (intermittent) loud cover ar/sunny		Air Temperature0 C Other
SITE LOCATION/MAP	Draw a map of the sit	e and indicate the	areas sampl	ed (or attach a photograph)
	G	A A A A		Sp Sp Govest Sp Sp Forest Sp Sp Sp Sp Sp Sp Sp Sp Sp Sp Sp Sp Sp
several photos severalso taken	Q Q		-2-100	
STREAM CHARACTERIZATION	Stream Subsystem • Perennial • Int Stream Origin • Glacial	ermittent • Tida		Stream Type • Coldwater Catchment Areakm ²
	 Non-glacial montan Swamp and bog 	• Spring-fec • Mixture o • Other	f origins	

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

Stream 68 5-pr 6/06/2012-2 PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse • Forest • Commercial • Field/Pasture • Industrial • Agricultural • Other • Residential	Local Watershed NPS Pollution No evidence • Some potential sources • Obvious sources Local Watershed Erosion • None • Moderate • Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the domina Shrubs dominant species present Mixed Mes:	Grasses · Herbaceous cale-maple-hicko-y-beech
INSTREAM FEATURES	Estimated Reach Length $\frac{1}{405}$ m ff Estimated Stream Width $\frac{6-14}{10}$ ff Sampling Reach Aream ² Area in km ² (m ² x1000)km ² Estimated Stream Depth $\frac{6-12}{10}$ m m Surface Velocitym/sec (at thalweg)m/sec	Canopy Cover • Partly open • Partly shaded • Shaded High Water Mark <u>1.5</u> • 44 Proportion of Reach Represented by Stream Morphology Types • Riffle <u>4.5</u> % • Run <u>30</u> % • Pool <u>56</u> % Channelized • Yes • Mo
LARGE WOODY DEBRIS	LWDm ² Lot 5 of uses Density of LWDm ² /km ² (LWD/ react	dy debris
AQUATIC VEGETATION	Indicate the dominant type and record the dominant • Rooted emergent • Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating
WATER QUALITY	Temperature°C Specific Conductance	Water Odors • Normal/None • Sewage • Petroleum • Chemical • Fishy • Other Water Surface Oils • Other Water Surface Oils • Globs • Flecks • Slick • Sheen • Globs • Flecks • None • Other • Other Turbidity (if not measured) • Turbid • Turbid • Opaque • Slightly turbid • Turbid
SEDIMENT/ SUBSTRATE	Odors · Sewage · Petroleum · Chemical · Anaerobic · None · Other Oils · Absent · Slight · Moderate · Profuse	Deposits • Sludge • Sawdust • Paper fiber • Sand • Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? • Yes • No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		10	Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")	30		materials (CPOM)	
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	25		(FPOM)	
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	
Silt	0.004-0.06 mm]		
Clay	< 0.004 mm (slick)]		

Stream 68 5-pr6/26/2012-2HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME 5- pr 6/06/2012-2	LOCATION Big Sandy Plant; Lawrence Co, WH
STATION # RIVERMILE	STREAM CLASS
LAT 38. 17564 LONG 82.64765	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS M-Thomayer, B.C.	9Ho
FORM COMPLETED BY M. Thomayor, B. OHO; URS Corp	DATE <u>6 JUNE 2017</u> REASON FOR SURVEY TIME <u>1227</u> AM CO LAND FIL

	Habitat	Condition Category								
	Parameter	Optimal	Suboptimal	Marginal	Poor					
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.					
	score /8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
ı sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.					
ed ir	score 18	20 19 🕼 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).					
Iram	score /4	20 19 18 17 16	15 👍 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
Pa	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.					
	score 16	20 19 18 17 6	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0					
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.					
89 SCORE 20 19 18 17 10		20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0					



Stream 68 5-pr 6/06/2012-2 HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat	Habitat Condition Category							
	Parameter	Optimal	Suboptimal	Marginal	Poor				
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.				
	score 20	19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0				
Parameters to be evaluated broader than sampling reach	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.				
	score <i>18</i>	20 19 🕼 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0				
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.				
e eva	SCORE $\underline{7}$ (LB)	Left Bank 10 9	8 0 6	5 4 3	2 1 0				
to b	score <u>7</u> (rb)	Right Bank 10 9	8 10 6	5 4 3	2 1 0				
Parameter	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.				
	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 🕄	2 1 0				
	SCORE 3 (RB)	Right Bank 10 9	876	5 4 3	2 1 0				
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.				
	SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0				
78	SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0				

Total Score 67

Stream 71 5-115/2012-7 sole (FDONT) Stream 71 5-115/2012-7 sole Channel #2 (FRONT)

STREAM NAMES-Judt 5/15/12-7 Side #3		LOCATION	Pig Sana	ly Plant; Lawrence	e Co. KY
STATION # Ŕ	STREAM CLASS				
LAT <u>38. /8557</u> LO	RIVER BASIN				
STORET #	AGENCY				
INVESTIGATORS M. T	homoyer, B. Otto				
FORM COMPLETED BY	DATE 15 May TIME 1358	2012 AM 10	REASON FOR SURVEY	<i>{</i>	
WEATHER CONDITIONS	Now		Past 24 hours	Has there been a heavy ra • Yes • No	in in the last 7 days?
	• rain (• showers %• %cl	(heavy rain) steady rain) (intermittent) oud cover ar/sunny	•	Air Temperature° C Other	
SITE LOCATION/MAP	Draw a map of the sit	e and indicate the	areas sampl	led (or attach a photograph	1)
	GPV 3	-1 -1 5.00	CP Comments	573	EP N Forest
	47	42	P	ja (C)	Ģ
	S	fortif C	7	10	S.
		-p	4	TI	5-Md+5/15/12-75
STREAM CHARACTERIZATION	Stream Subsystem Perennial Stream Origin Glacial Non-glacial montane Swamp and bog	• Spring-fec • Mixture o • Other	1	Stream Type • Coldwater • Warmw Catchment Area	vater km²

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

Stream 71 studt s/15/12-7 side channel (BACK)

WATERS FEATURI		• Fores • Field • Agric	ninant Surrounding Land Pasture · Commer Pasture · Industria cultural · Other lential	cial	Local Watershed NPS) • <u>No evidence</u> -• Some • Obvious sources Local Watershed Erosi • None • Moderate	potential sources	
RIPARIA VEGETA (18 meter	FION	Indicat Trees domina	e the dominant type and • Sh int species present	record the dom rubs	n <mark>inant species present</mark> • Grasses Balu-Maple- hickory	rbaceous -beech	
				m ² m ² min up	Canopy Cover • Partly open • Partly High Water Mark Proportion of Reach R Morphology Types • Riffle <u>40</u> % • Pool <u>70</u> % Channelized • Yes Dam Present • Yes	L' B.C.	
ļ					Dam Tresent - Tes	110	
LARGE WOODY LWD m² Lots f DEBRIS Density of LWD m²/km² (LWD/ res				each area) debris			
AQUATIC VEGETAT	FION	Indicate the dominant type and record the dominant species present Rooted emergent Rooted submergent Rooted submergent Rooted floating Free floating dominant species present Mone Portion of the reach with aquatic vegetation % 					
WATER QUALITY Temperature ° C Specific Conductance Dissolved Oxygen pH Turbidity WQ Instrument Used		\sum	Water Odors • Normat/None • Sewa • Petroteum • Fishy Water Surface Oils • Slick • Sheen • • None • Other Turbidity (if not measu • Clear • Slightly tu • Opaque • Stained	Globs • Flecks			
SEDIMENT/ SUBSTRATE		Odors Norma Chemical Other Oils Anaerobic None Petroleum None None Potroleum None Potroleum None None		Relict shells Looking at stones whic are the undersides blac	 Sludge • Sawdust • Paper fiber • Sand Relict shells • Other Looking at stones which are not deeply embedded, are the undersides black in color? 		
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)					ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate	Diamet	er	% Composition in Sampling Reach	Substrate	Characteristic	% Composition in Sampling Area	

Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	15		materials (CPOM)	
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	35		(FPOM)	
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm]		
Clay	< 0.004 mm (slick)	10]		

Stream "71 S-Not 5/15/2012-75ide chunnel 43 HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAMES-rudts/15/12-3 side # 3	LOCATION Big Sandy Plant, Lawrence Co, KY	
STATION # RIVERMILE	STREAM CLASS	
LAT 38. 18557 LONG 82.65327	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS M. Thomayer, B. C	Mo	
FORM COMPLETED BY H. THOMAYER B. Otto ; OPS Corp	DATE 15 May 2017 TIME 1358 AM B Landfill	

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
1	score 13	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	2. Embeddedness	Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
ted in	SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
uram	score 7	20 19 18 17 16	15 14 13 12 11	10 9 8 🗇 6	5 4 3 2 1 0
P	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score 13	20 19 18 17 16	15 14 🕼 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
55	score 7	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 2

Stylem 71 570/15/2012 - 7 side HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK) channel #3

	Habitat Condition Category				
	Parameter	Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated broader than sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be p resent, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score 14	20 19 18 17 16	15 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	score /3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
e eva	score 7 (LB)	Left Bank 10 9	8 1 6	5 4 3	2 1 0
tob	score <u>7</u> (rb)	Right Bank 10 9	8 9 6	5 4 3	2 1 0
Parameters	9. Vegetative Protection (score each bank) SCORE <u>(</u> (LB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	U U	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone) 7	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE $\frac{1}{7}$ (LB)	Left Bank 10 9	8 Ø 6	5 4 3	2 1 0
3	SCORE ((RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score ______



APPENDIX E

DELINEATED FEATURES PHOTOGRAPHS





E1 – WETLANDS



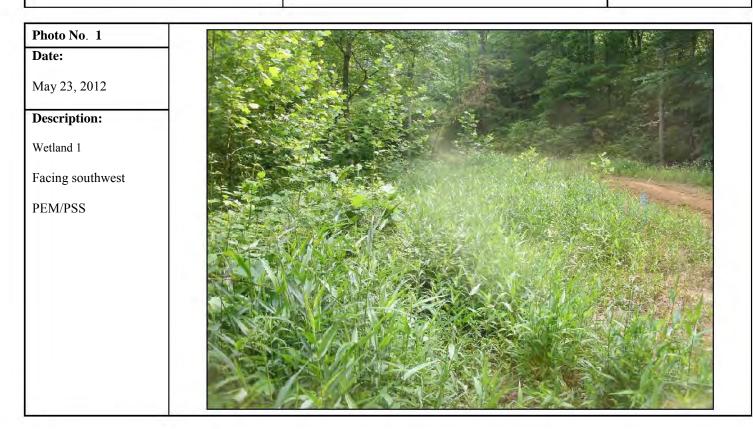


Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project







Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project







Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 5 Date: May 24, 2012 **Description:** Wetland 5 Facing south PEM





Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152







PHOTOGRAPHIC RECORD Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project







Wetlands

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152







PHOTOGRAPHIC RECORD Wetlands







Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project







Wetlands

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 17 Date: October 15, 2012 **Description:** Wetland 17 Facing east PFO



E2 –STREAMS





AEP

PHOTOGRAPHIC RECORD

Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 3	
Date:	
May 2, 2012	
Description:	
Stream 3	
Facing downstream	
Ephemeral stream	

Photo No. 4 Date: October 15, 2012 Description: Stream 4 Facing Downstream Intermittent stream



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 5	
Date:	
October 15, 2012	
Description:	
Stream 5	
Facing Upstream	
Ephemeral stream	





Streams

Client Name: Dames & Moore AEP

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 11	
Date:	
May 3, 2012	
Description:	
Stream 11	
Facing upstream	
Intermittent stream	
	A Section of the sect

Photo No. 12 Date: May 3, 2012 Description: Stream 12 Facing downstream Ephemeral stream



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

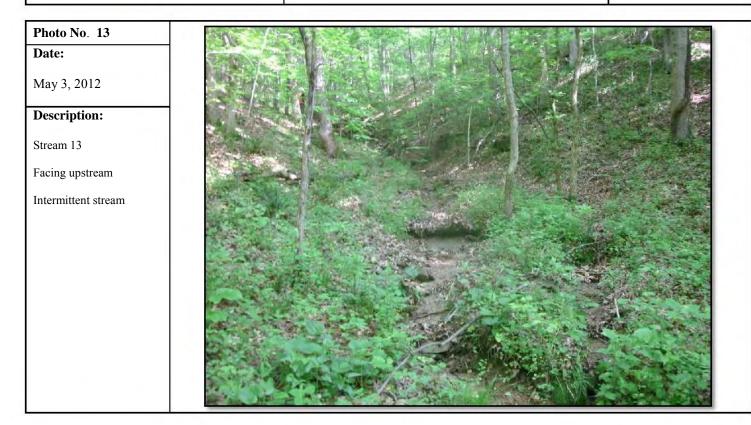


Photo No. 14 Date: May 4, 2012 Description: Stream 14 Facing upstream Ephemeral stream





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

 Photo No. 15

 Date:

 May 4, 2012

 Description:

 Stream 15

 Facing upstream

 Intermittent stream

Photo No. 16Date:May 4, 2012Description:Stream 16Facing downstreamEphemeral stream



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

 Photo No. 17

 Date:

 May 15, 2012

 Description:

 Stream 17

 Facing upstream

 Intermittent stream



AEP



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 19	
Date:	
May 15, 2012	
Description:	
Stream 19	
acing upstream	
phemeral stream	
	and the second s





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

 Photo No. 21

 Date:

 May 24, 2012

 Description:

 Stream 21

 Facing upstream

 Ephemeral stream

Photo No. 22 Date: May 24, 2012 Description: Stream 22 Facing downstream Intermittent stream



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

 Photo No. 23

 Date:

 May 24, 2012

 Description:

 Stream 23

 Facing downstream

 Ephemeral stream





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

 Photo No. 27

 Date:

 October 15, 2012

 Description:

 Stream 27

 Facing upstream

 Ephemeral stream





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152





AEP



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 31	
Date:	
June 7, 2012	
Description:	
Stream 31	A CARLEN AND AND A CARLEND
Landfill Outfill	
Intermittent Stream	





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152





AEP



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152



Photo No. 36 Date: May 4, 2012 Description: Stream 36 Facing upstream Ephemeral stream



Streams

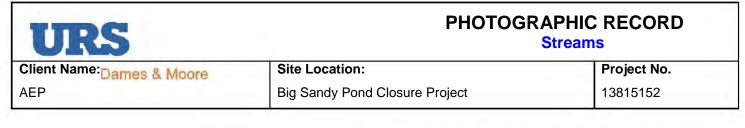
Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project













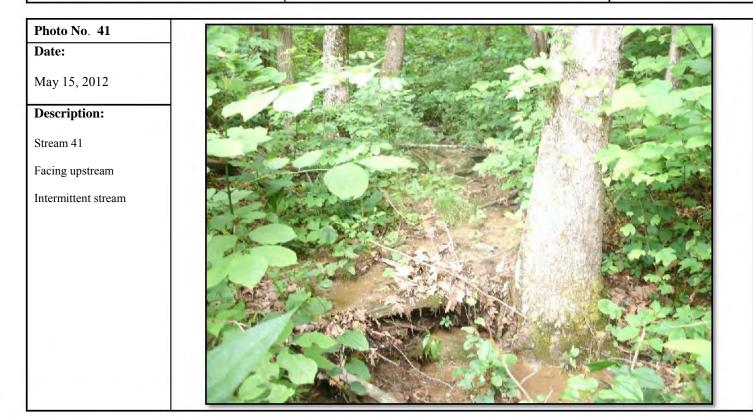
Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152



Date: May 15, 2012 Description:

Photo No. 42

Stream 42

Facing downstream

Ephemeral stream





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 45	
Date:	
May 24, 2012	
Description:	
Stream 45	
Facing upstream	
Ephemeral stream	
	ALL CONTRACTOR SET R

Photo No. 46 Date:

May 24, 2012

Description:

Stream 46

Facing downstream

Intermittent stream





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152



Photo No. 48 Date: May 24, 2012 Description: Stream 48 Facing downstream Ephemeral stream

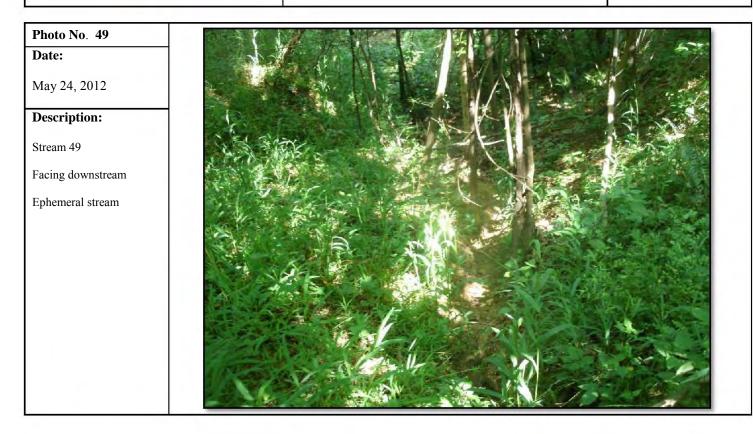


Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152





Photo No. 52

Description:

Stream 52

Facing downstream

Ephemeral stream





1 6.0

Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 53				
Date:				
June 5, 2012			- Hu Mer	
Description:				AR
tream 53	THE LEAD		M. A.	
acing downstream	Strain and		and the second	
Ephemeral stream				
		N. W. Brand	- Company	Con Alt
			and the second sec	
	Sec. Labora	The second second	14-2-2 C	2000
		and to and a	R Sta	
			A	





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152

Photo No. 55	
Date:	
June 5, 2012	
Description:	
Stream 55	
Facing downstream	
Ephemeral stream	

Photo No. 56 Date: June 5, 2012 Description: Stream 56 Facing downstream Ephemeral stream

AEP



Streams

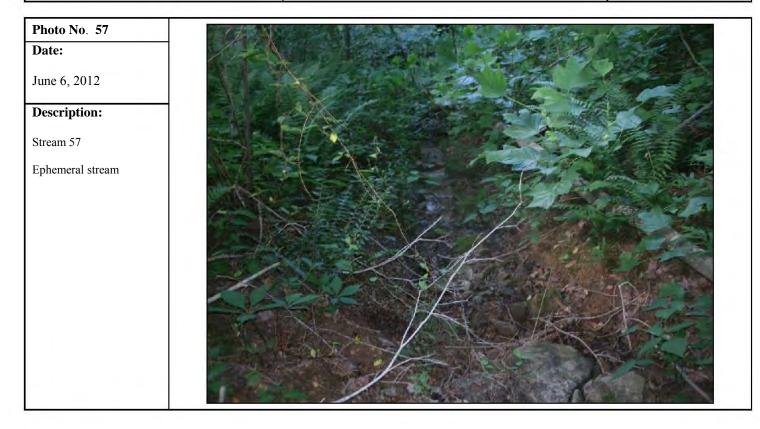
Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152





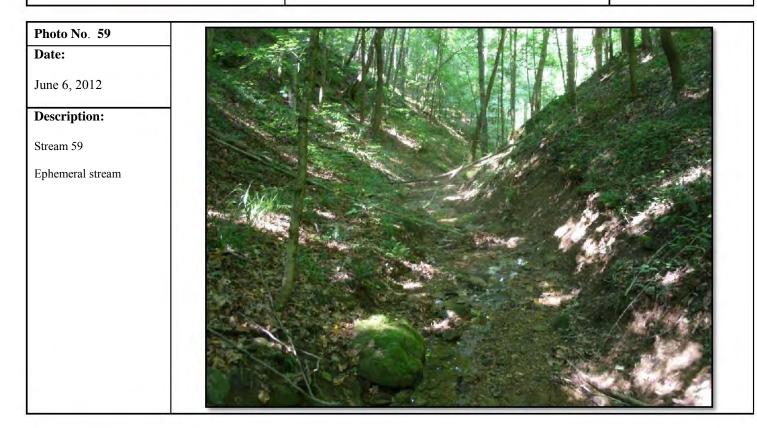


Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 61	
Date:	
June 5, 2012	
Description:	
Stream 61	A CONTRACT OF A
Facing upstream	A DE REAL AND A DE
Ephemeral stream	





AEP

PHOTOGRAPHIC RECORD

Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152







AEP

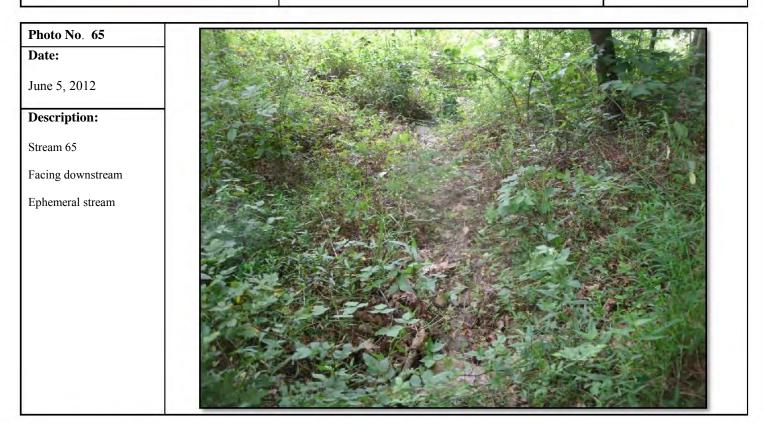
PHOTOGRAPHIC RECORD

Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project







Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project





URS	PHOTOGRAPHIC RECORD Streams		
Client Name: Dames & Moore	Site Location:	Project No.	
AEP	Big Sandy Pond Closure Project	13815152	
Photo No. 69			
Date:			
June 6, 2012			
Description:			
Stream 69			
Ephemeral stream			
	(no photo available)		





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 71	
Date:	
May 23, 2012	
Description:	
tream 71	
acing upstream	
ntermittent stream	





Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No. 13815152



Photo No. 74 Date: October 15, 2012

Description:

Stream 74

Facing upstream

Ephemeral stream





AEP

PHOTOGRAPHIC RECORD

Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152

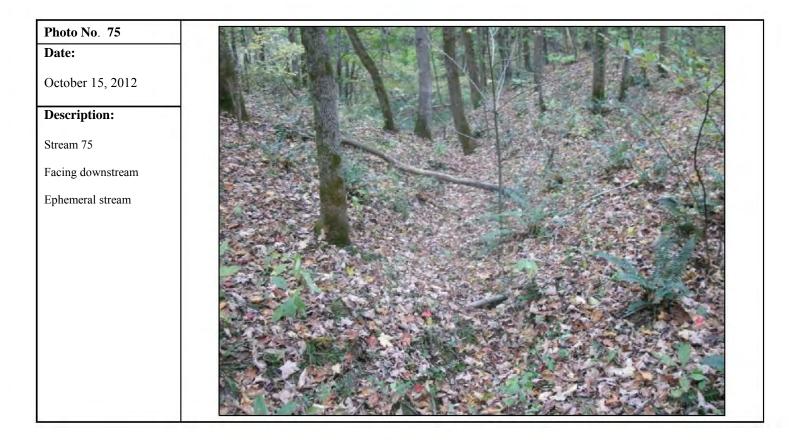


Photo No. 76	
Date:	
October 15, 2012	
Description:	and the second of the second o
Stream 76	
Facing upstream	
Ephemeral stream	



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Project No.

13815152





AEP



Streams

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project

Photo No. 79	
Date:	
October 15, 2012	
Description:	
Stream 79	
Facing upstream	
Ephemeral stream	





E3 – PONDS





Ponds

Client Name: Dames & Moore

Site Location:

Big Sandy Pond Closure Project





DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, LOUISVILLE CORPS OF ENGINEERS P.O. BOX 59 LOUISVILLE KY 40201-0059 FAX: (502) 315-6677 http://www.lrl.usace.army.mil/

SEP 2 9 2014

September 18, 2014

Operations Division Regulatory Branch (South) ID No. LRL-2014-417-mdh

Ms. Jill Lukehart American Electric Power 1 Riverside Plaza Columbus, OH 43215

Dear Ms. Lukehart:

This is in response to your request for an approved jurisdictional determination. The request was made for a 602-acre parcel, including a fly ash disposal pond associated with the Big Sandy Power Plant and adjacent lands, located near the City of Louisa in Lawrence County, Kentucky.

The U.S. Army Corps of Engineers exercises regulatory authority under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403) and Section 404 of the Clean Water Act (33 U.S.C. § 1344) for certain activities in "waters of the United States (U.S.)." These waters include all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce.

Based on a review of the submitted information, we have verified that the one-hundred and fifty-three (153) identified tributaries (see *Table 1*), possess a significant nexus and as such are considered jurisdictional "waters of the U.S." In addition, the report identified twelve (12) wetlands and one (1) open water (see *Table 1*), which either abut or lie adjacent to one of the aforementioned tributaries. These stream channels, adjacent/abutting wetlands and open water perform numerous functions which have a substantial, or more than speculative, effect on the Big Sandy River (a traditional navigable waters).

Therefore, if construction activities would require discharges of dredged or fill material within the delineated boundaries of the twelve (12) wetlands and/or below the Ordinary High Water Mark (OHWM) of the one (1) open water or the one-hundred and fifty-three (153) stream channels (i.e., any of the *Table 1* waters), then a Department of the Army (DA) permit would be required.

In addition to these waters, the report identified four (4) isolated wetlands, which lack a significant nexus (see *Table 2*). These waters do not appear to be used or be susceptible to use in interstate or foreign commerce. As such, these waters are not considered to be "waters of the U.S."

Further, the 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water (KPDES Permit# KY0000221). Per 33 C.F.R. § 328.3(a)(8) of our regulations, such waters are not considered to be jurisdictional "waters of the U.S." Also, since Wetland 8 lies within the Fly Ash Pond's maximum operating pool elevation, it is also not considered jurisdictional per 33 C.F.R. § 328.3(a)(8).

Therefore, a DA permit is not required for proposed impacts to these waters (see *Table 2*). However, this determination does not relieve you of the responsibility to comply with applicable State law. We urge you to contact the Kentucky Energy & Environment Cabinet Division of Water, 200 Fair Oaks, 4th Floor Frankfort, Kentucky 40601, to determine the applicability of State law to your project.

This letter contains an approved jurisdictional determination for the 602-acre subject parcel and is valid for a period of five (5) years from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 C.F.R. § 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination, you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address.

> Appeals Review Officer Great Lakes and Ohio River Division CELRD-PD-REG 550 Main Street, Room 10032 Cincinnati, OH 45202-3222 (513) 684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. § 331.5, and that it has been received by the Division Office within **60 days** of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **November 17, 2014**. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

If we can be of any further assistance, please contact us by writing to the above address, ATTN: CELRL-OP-FS, or call me at (502) 315-6676. Any correspondence on this matter should refer to our ID Number LRL-2014-417-mdh.

Sincerely,

Michael Hasty Senior Project Manager, South Section Regulatory Branch

Enclosures

Copy Furnished:

Mr. James Bicknell Kentucky Energy & Environment Cabinet Division of Water 200 Fair Oaks, 4th Floor Frankfort, KY 40601

Mr. Matt Thomayer URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202

1	Table 1: (Jurisdictional Stream Channels, Weth			Size	
ID #	Description/Tribuary Name	Latitude	Longitude	(acres= ac) (If =linear feet	
Wetland 01	Wetland 01 Emergent/Scrub-Shrub Wetland		-82.65042	0.06 ac	
Wetland 02	Emergent Wetland	38.184948	-82.650542	0.03 ac	
Wetland 06	Emergent/Scrub-Shrub Wetland	38.185745	-82.637086	0.03 ac	
Wetland 09	Emergent/Scrub-Shrub Wetland	38.185936	-82.635573	0.06 ac	
Wetland 10	Emergent Wetland	38.187993	-82.633528	0.02 ac	
Wetland 11	Emergent Wetland	38.187827	-82.632687	0.05 ac	
Wetland 12	Emergent Wetland	38.188183	-82.631769	0.02 ac	
Wetland 13	Emergent Wetland	38.187824	-82.631001	0.03 ac	
Wetland 15	Emergent Wetland	38.179389	-82.625917	0.06 ac	
Wetland 14	Emergent/Scrub-Shrub Wetland	38.179076	-82.625342	0.21 ac	
Wetland 16	Emergent/Scrub-Shrub Wetland	38.179511	-82.624825	0.08 ac	
Wetland 17	Forested Wetland	38.185963	-82.625944	0.55 ac	
Pond 01	Pond	38.177116	-82.641885	0.24 ac	
Stream 68	Unnamed Perennial (RPW) Tributary of Fuller's Branch	38.176515	-82.647681	1,381 If	
Stream 30	Unnamed Perennial (RPW) Tributary of Blaine Creek		-82.633499	558 lf	
		38,188125	terrority of the second s		
Stream 44	Horseford Creek-Perennial (RPW) Tributray of Blaine Creek	38.18353	-82.65165	2,379 lf	
Stream 58	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174032	-82.647949	604 lf	
Stream 59	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174786	-82.646863	881 lf	
Stream 59a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174412	-82.646894	304 lf	
Stream 60	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38,176137	-82.646625	692 lf	
Stream 60a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175762	-82.647063	149 lf	
Stream 68a	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174678	-82.648721	92 lf	
Stream 68b	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17473	-82.648255	62 lf	
Stream 68c	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17447	-82.648223	224 lf	
Stream 68d	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175023	-82.647836	158 lf	
Stream 68e	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174797	-82.648466	69 lf	
Stream 68f	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175329	-82.647784	68 lf	
Stream 68g	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.174959	-82.648427	130 lf	
Stream 68h	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17541	-82.647479	200 lf	
Stream 68i	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.17517	-82.648242	104 lf	
Stream 68j	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175685	-82.647456	102 lf	
Stream 68k	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.175554	-82.647476	139 lf	
Stream 681	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177244	-82.647641	65 lf	
tream 68m	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177145	-82.647626	85 lf	
Stream 68n	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.177322	-82.647374	204 lf	
Stream 680	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176957	-82.647088	256 lf	
Stream 68p	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.1764	-82.647351	58 lf	
Stream 68q	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176428	-82.646887	251 lf	
Stream 68r	Unamed Ephemeral (Non-RPW) Tributary of Fuller's Branch	38.176653	-82.647099	266 lf	
Stream 05	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179566	-82.625246	70 lf	
Stream 26	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179403	-82.624443	178 lf	
Stream 27	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179562	-82.624478	154 lf	
Stream 28	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18034	-82.624501	185 lf	
Stream 29	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.180985	-82.624289	138 lf	
Stream 72	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.181433	-82.624959	175 lf	
Stream 73	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182305	-82.625104	210 lf	
Stream 74	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184755	-82.626268	336 lf	
Stream 75	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185768	-82.626399	108 lf	
Stream 76	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186226	-82.626544	385 lf	
Stream 77	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185364	-82.625733	36 lf	
Stream 78	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183861	-82.624616	354 lf	
Stream 78a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183771	-82.624265	120 lf	
Stream 78b	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183921	-82.62445	61 lf	
Stream 78c	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184067	-82.624865	96 lf	
Stream 79	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182304	-82.623863	542 lf	
Stream 79a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182473	-82.623487	391 lf	
tream 79aa	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182373	-82.622941	53 lf	
Stream 80	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186308	-82.626727	132 lf	

Louisville District, LRL-2014-417-mdh

			Size	
ID #	Description/Tribuary Name	Latitude	Longitude	(acres= ac) (If =linear feet
Stream 80a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18624	-82.62678	80 lf
Stream 01	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18278	-82.642085	402 lf
Stream 01a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18292	-82.642209	176 lf
Stream 02	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182358	-82.641507	411 lf
Stream 02a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182345	-82.641158	157 lf
Stream 03	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182731	-82.642327	313 lf
Stream 06	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180497	-82.640554	170 lf
Stream 07	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18074	-82.64076	278 lf
Stream 08	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182257	-82.642054	101 lf
Stream 09	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182792	-82.64174	479 lf
Stream 09a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182594	-82.641687	119 lf
Stream 09b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182694	-82.64161	194 lf
Stream 10	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183665	-82.644132	95 lf
Stream 11a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18441	-82.643544	117 lf
Stream 11b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184944	-82.643781	104 lf
Stream 11c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184638	-82.64308	381 lf
Stream 11d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184545	-82.64252	129 lf
Stream 11e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184364	-82.644005	62 lf
Stream 12	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184279	-82.644254	95 lf
Stream 13a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185804	-82.648927	56 lf
Stream 13b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186405	-82.648953	306 lf
Stream 13c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186111	-82.649453	185 lf
Stream 14	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177507	-82.639347	183 lf
Stream 15a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176481	-82.642261	47 lf
Stream 15b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176163	-82.642182	104 lf
Stream 15c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176046	-82.642318	173 lf
Stream 15d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175778	-82.642329	245 lf
Stream 15e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175752	-82.642651	61 lf
Stream 15f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175687	-82.643729	646 lf
Stream 15g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175682	-82.643372	275 lf
Stream 16	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17767	-82.642599	132 lf
Stream 17a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179664	-82.644962	1111f
Stream 17b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179373	-82.645296	112 lf
Stream 17c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178786	-82.646264	233 lf
Stream 18a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182426	-82.64647	93 If
Stream 18b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182388	-82.646877	100 lf
Stream 180	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182388	-82.647548	113 lf
Stream 18d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182362	-82.647975	87 lf
Stream 18e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.648736	43 lf
Stream 186	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182427	-82.64916	43 II 114 If
Stream 18g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182275	-82.649426	69 lf
Stream 19	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183625	-82.646425	182 lf
	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183023	-82.649346	740 lf
Stream 20		38.184416	-82.648381	81 lf
Stream 20a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond		-82.649448	138 lf
Stream 20b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183988		
Stream 20c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183736	-82.64961	294 lf
Stream 21	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183258	-82.637508	84 lf
Stream 23	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183783	-82.638926	165 lf
Stream 23a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183776	-82.63877	77 lf
Stream 24	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181997	-82.635548	177 lf
Stream 25	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182203	-82.63839	415 lf
Stream 33	Unnamed Ephemeral (Non-RPW)Tributary to fly ash pond	38,183828	-82.6441	64 lf
Stream 34	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184202	-82.643787	141 lf

1000	Table 1: (Jurisdictional Stream Channels, Wet	1		Size
ID #	Description/Tribuary Name	Latitude	Longitude	(acres= ac) (If =linear feet
Stream 35a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185921	-82.645834	211 lf
Stream 35b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185204	-82.6465	78 lf
Stream 36	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177545	-82.638531	280 lf
Stream 37	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176969	-82.642526	171 lf
Stream 38	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17922	-82.644498	279 lf
Stream 40	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1813	-82.645778	157 lf
Stream 41a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18117	-82.646067	56 lf
Stream 42	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182146	-82.648394	114 lf
Stream 43	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184011	-82.647594	368 lf
Stream 44a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18488	-82.650217	554 lf
Stream 44b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182484	-82.653843	633 lf
Stream 44c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181227	-82.653997	232 lf
Stream 45	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183078	-82.637348	93 lf
Stream 47	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82,635048	48 lf
Stream 48	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183095	-82.638419	73 lf
Stream 49	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181963	-82.637701	109 lf
Stream 50	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185788	-82.635826	116 lf
Stream 51	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185756	-82.635877	75 lf
Stream 52	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181211	-82.628042	47 lf
Stream 53	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182467	-82.627866	64 lf
Stream 54	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182315	-82.627723	39 lf
Stream 55	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184567	-82.629622	88 lf
Stream 56	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178126	-82.633154	36 lf
Stream 57	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178022	-82.630229	43 lf
Stream 61	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180213	-82.627552	31 lf
Stream 62	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182122	-82.627641	70 lf
Stream 63	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38,182254	-82.627658	77 lf
Stream 64	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184825	-82.629898	77 lf
Stream 65	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185999	-82.630599	19 lf
Stream 66	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186103	-82.630655	30 lf
Stream 67	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178037	-82.63036	51 lf
Stream 70a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183487	-82.651216	75 lf
Stream 70b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183499	-82.650664	310 lf
Stream 71a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185856	-82.652998	262 lf
Stream 71b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18583	-82.653492	131 lf
Stream 71c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186375	-82.654015	548 lf
Stream 71d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1858	-82.654716	440 lf
Stream 71e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185899	-82.655866	81 lf
Stream 71f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185596	-82.655933	222 lf
Stream 04	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.179875	-82.625015	3,343 lf
Stream 11	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.184825	-82.643639	491 lf
Stream 13	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185593	-82.648905	816 lf
Stream 15	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.17573	-82,642819	895 lf
Stream 17	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.179089	-82.645326	797 lf
Stream 18	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.18225	-82.648104	1,120 lf
Stream 22	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.183653	-82.63824	186 lf
Stream 35	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185591	-82.646285	561 lf
Stream 39	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.181365	-82.645372	169 lf
Stream 41	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.181378	-82.645992	652 lf
Stream 46	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.18363	-82.638883	432 lf
Stream 70	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.183888	-82.650984	432 lf
Stream 70	Unnamed Intermittent (RPW)Tributary to fly ash pond	38.185572	-82.653279	1,816 lf
Stream 31	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.185572	-82.630791	371 lf
Stream 31 Stream 32	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188001	-82.631772	315 lf

Table 2 (Non-jurisdictional waters):					
ID#	Description	Latitude	Longitude	Size (acres)	
Wetland 03	Isolated Emergent Wetland	38.184148	-82.64005	0.08	
Wetland 04	Isolated Emergent Wetland	38.184414	-82.640347	0.14	
Wetland 05	Isolated Emergent Wetland	38.18358	-82.639877	0.11	
Wetland 07	Isolated Emergent Wetland	38.182916	-82.638806	0.07	
Wetland 08	Emergent Wetland	38.18342	-82.638723	0.04	
Fly Ash Pond	Fly Ash Pond	38.182151	-82.630658	130	

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Isolated Wetlands W-3, W-4, W-5 and W-7

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38°-10'-49.441"N, Long 82°-38'-16.344"W.

Universal Transverse Mercator:

Name of nearest waterbody: Blaine Creek Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- Office (Desk) Determination. Date:
- Field Determination. Date: August 12, 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: linear feet: width (ft) and/or acres. Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):³
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The four isolated wetlands, referred to as Wetlands 03, 04, 05, and 07, are physically isolated, do not lie within the 100-year floodplain, lack a hydrological connection and are not adjacent to other "waters of the U.S." and do not have any shallow subsurface flow to other waters. The wetlands are not used nor are they susceptible to use in interstate or foreign commerce. Thus, the wetlands are not considered to be "waters of the U.S."

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, Isolated Wetlands W-3, W-4, W-5 and W-7

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

- 1. TNW
 - Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section 111.B.1 for the tributary, Section 111.B.2 for any onsite wetlands, and Section 111.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section 111.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Drainage area:

Average annual rainfall: Average annual snowfall:

- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - Tributary flows through tributary before entering TNW.

Project waters are river miles from TNW. Project waters are river miles from RPW. Project waters are aerial (straight) miles from TNW. Project waters are aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is:
Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

Louisville District, LRL-2014-417-mdh, Isolated Wetlands W-3, W-4, W-5 and W-7

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West. ⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

		Aver Aver	y properties wit age width: age depth: age side slopes		to top of bank	(estimate)	E.						
			ibutary substra Silts	te compos	sition (check al Sands	ll that app	ly): I		Concrete				
		Г	Cobbles	Г	Gravel		3	с.	Muck				
		Г	Bedrock	Г	Vegetation.	Type/% c	over						
		L.C.	Other. Explain	detritus									
		Presence of Tributary	condition/stabi of run/riffle/poo geometry: gradient (appro	ol comple:	xes. Explain:		g banks]. E:	xpla	in:				
(c)	(c)	Flow: Tributary provides for: Estimate average number of flow events in review area/year: Describe flow regime: Other information on duration and volume:											
		Surface fl	ow is: Charac	eristics:									
			e flow: Expla Dye (or other)										
		FI	has (check all t Bed and banks OHWM ⁶ (chec			ly):							
		Г	clear, natur	al line imj	pressed on the	bank 🗂	the presence	e of	litter and debris				
		Г	changes in	he charac	ter of soil	E)	destruction	oft	errestrial vegetation				
		Г	shelving			F [the presence	e of	wrack line				
		Г	Vegetation :	natted do	wn, bent, or ab	sent Γ	sediment so	ortin	g				
		Г	leaf litter di	sturbed o	r washed away		scour						
		r.	sediment de	position		- EI	multiple ob	serv	red or predicted flow events				
		5	water staini	ng		E.	abrupt char	nge i	in plant community				
		1	other (list):										
			Discontinuous	OHWM.	Explain:								
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):											
			oil or scum				and the second second second		able datum;				
			Sector and the sector sector		eposits (foreshe		physical ma						
		E	10 m 0 m 0 m 10 m 10 m		aracteristics	Г			s/changes in vegetation types.				
		F	tidal gauge:		and the first state of the		- Strange						
		Г	other (list):										
/		indial Ch											
(10			iracteristics: ibutary (e.g., w	ater color	is clear, disco	lored oily	film: water	aua	lity: general watershed characteristics.				

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

Louisville District, LRL-2014-417-mdh, Isolated Wetlands W-3, W-4, W-5 and W-7

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width):
 - Wetland fringe. Characteristics:
 - ☐ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: acres
 - Wetland type. Explain:
 - Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Explain: Surface flow is: Characteristics:

Subsurface flow: Explain findings:

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- □ Directly abutting
- √ Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - ✓ Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW. Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - ► Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Approximately (#) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g., between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - √ Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters:
- C Other non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs8 that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters:
- C Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW;
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area:

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

7. Impoundments of jurisdictional waters.9

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - I which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - **[**] from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - **[**] which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - ✓ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tibutary waters: linear feet width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:
 - Wetlands: acres.
- ⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- F If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:.
- Wetlands: Four wetlands totaling 0.40 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- □ Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands:

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [7] Office concurs with data sheets/delineation report.
 - [] Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle

 - FEMA/FIRM maps: 21127C0120D
 - [100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: | Aerial (Name & Date):
 - or 🔽 Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
 - Previous determination(s). File no. and date of response letter:
 - ☐ Applicable/supporting case law:

- ► Applicable/supporting scientific literature:
- C Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The four (4) wetlands have no substantial nexus to a water of the U.S as they are physically isolated, do not lie within the 100-year floodplain and lack a hydrological connection to other waters of the United States. The wetlands are also not used nor are they susceptible to use in interstate or foreign commerce. Therefore, the wetlands are not considered to be "waters of the U.S.".

ID#	Description	Latitude	Longitude	Size (acre)	HUC	Quad Fallsburg Fallsburg Fallsburg Fallsburg
Wetland 03	Isolated Emergent Wetland	38.184148	-82.64005	0.08	Big Sandy Big Sandy Big Sandy	
Wetland 04	Isolated Emergent Wetland	38.184414	-82.640347	0.14		
Wetland 05	Isolated Emergent Wetland	38.18358	-82.639877	0.11		
Wetland 07	Isolated Emergent Wetland	38.182916	-82.638806	0.07	Big Sandy	Fallsburg
Total: 4		0.40				

POTENIAL ISOLATED WETLANDS WITHIN THE BIG SANDY POND CLOSURE PROJECT

11

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

R DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

PROJECT LOCATION AND BACKGROUND INFORMATION: C

County/parish/borough: Lawrence County State: Kentucky City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38°-10'-49.441"N, Long 82°-38'-16.344"W.

Universal Transverse Mercator: Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- ~ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc ...) are associated with this action and are recorded on a different 2 JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- 2 Office (Desk) Determination. Date: July 24, 2014
- Г Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Г Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Г Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas Г
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs 1
- Non-RPWs that flow directly or indirectly into TNWs
- 5 Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs 10
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: Two (2) intermittent stream channels totaling 686 linear feet: 5 width (ft). Wetlands: Three (3) emergent wetlands totaling 0.10 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM
 - Elevation of established OHWM (if known):
- 2. Non-regulated waters/wetlands (check if applicable):3
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Г Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.
² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

I. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Big Sandy Watershed: 410.4 square miles. Drainage area;

Average annual rainfall: 50 inches Average annual snowfall: 21 inches

- (ii) Physical Characteristics:
 - (a) Relationship with TNW:
 - Tributary flows directly into TNW.
 - Tributary flows through 1 tributary before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: Streams 31 and 32 both flow into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW).

Tributary stream order, if known: Second & Third, respectively.

- (b) General Tributary Characteristics (check all that apply):
 - Tributary is: Natural
 - Artificial (man-made) Explain: Streams originate at dam outfall of fly ash wastewater treatment pond.
 - Manipulated (man-altered). Explain: Streams contain culverts, riprap, level spreaders

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

³ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary properties with respect to top of bank (estimate): Average width: 5 feet Average depth: 3-18 inches Average side slopes: 3:1 Primary tributary substrate composition (check all that apply): Silts Sands Concrete V Cobbles Gravel Muck Г Bedrock Г Vegetation. Type/% cover: 1 Other. Explain: detritus, boulder, riprap Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated. Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes were observed in both streams. Tributary geometry: Relatively Straight Tributary gradient (approximate average slope): % (c) Flow: Tributary provides for: Seasonal Flow Estimate average number of flow events in review area/year: 20 (or greater) Describe flow regime: Intermittent Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there is an average of approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. Surface flow is: Discrete and Confined Characteristics: Subsurface flow: Unknown Explain findings: Dye (or other) test performed: Tributary has (check all that apply): Bed and banks ✓ OHWM⁶ (check all indicators that apply): Clear, natural line impressed on the bank [] the presence of litter and debris C changes in the character of soil destruction of terrestrial vegetation □ shelving T the presence of wrack line vegetation matted down, bent, or absent sediment sorting I leaf litter disturbed or washed away scour Sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM.7 Explain: If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: Mean High Water Mark indicated by: oil or scum line along shore objects survey to available datum; [] fine shell or debris deposits (foreshore) [] physical markings; physical markings/characteristics vegetation lines/changes in vegetation types. ☐ tidal gauges

□ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water color in Stream 31 appeared to be clear and originates from the fly ash wastewater treatment pond. Water was not observed in Stream 32.

Identify specific pollutants, if known:

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): 6-12 meters
 - Wetland fringe. Characteristics: Wetland 12 abuts Stream 32. Wetland 13 abuts Stream 31.
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties:

Wetland size: 0.10 acres Wetland type. Explain: Emergent Wetland quality. Explain: Low, ORAM Category I Project wetlands cross or serve as state boundaries. Explain:

(b) <u>General Flow Relationship with Non-TNW</u>: Flow is: Intermittent Flow Explain:

> Surface flow is: Overland Sheetflow Characteristics:

Subsurface flow: Explain findings:

- (c) Wetland Adjacency Determination with Non-TNW:
 - P Directly abutting
 - Not directly abutting
 - [v] Discrete wetland hydrologic connection. Explain: Wetland 11 is located in close proximity to Stream 32 (<60 ft.) and is within the 100-year floodplain.
 - Ecological connection. Explain: Wetland 11 is located in close proximity to Stream 32 (<60 ft.) and provides ecological functions such as stormwater attenuation, filtering and wildlife habitat.
 - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are 1-2 river miles from TNW. Project waters are 1-2 aerial (straight) miles from TNW. Flow is from: Wetland to Navigable Waters Estimate approximate location of wetland as within the within 100-year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.
- Vegetation type/percent cover. Explain: herbaceous 100%
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - □ Other environmentally-sensitive species. Explain findings:
 - P Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 3

Approximately (0.10) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)	
Wetland-11 N	0.05			
Wetland-12 Y	0.02			
Wetland-13 Y	0.03			

Summarize overall biological, chemical and physical functions being performed: Wetlands 11, 12, and 13 function as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands also have the capacity to transfer nutrients and organic carbon to support downstream food-webs.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g., between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain
 findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the three (3) emergent wetlands, totaling 0.10 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to the two (2) identified unnamed intermittent (RPW) tributaries (Streams 31 and 32). These intermittent tributaries function as headwater stream channels providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial, or more than speculative, effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:

- TNWs: linear feet width (ft), Or, acres.
- Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there is an average of approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceeds three months.

Provide estimates for jurisdictional waters in the review area (check all that apply):

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

- Tributary waters: Two (2) intermittent stream channels totaling 686 linear feet.
- C Other non-wetland waters: acres.
 - Identify type(s) of waters:
- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
 - Provide estimates for jurisdictional waters within the review area (check all that apply):
 - T Tributary waters:
 - □ Other non-wetland waters: acres.
 - Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
 - F | Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetland 12 is physically proximate to Stream 32. Wetland 13 is physically proximate to Stream 31.

Provide acreage estimates for jurisdictional wetlands in the review area: Two wetlands (Wetland 12 and Wetland 13) totaling 0.05

- acres.
- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: One wetland (Wetland 11) totaling 0.05 acres is adjacent to Stream 32.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - [] from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - [] which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - □ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.
- See Footnote # 3.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

[&]quot;To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identify type(s) of waters:

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- □ Lakes/ponds: acres.
 □
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- C Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - IV Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - [♥] U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.
 - □ State/Local wetland inventory map(s):
 - FEMA/FIRM maps: 21127C0120D

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- [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: | Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)

Louisville District, LRL-2014-417-mdh. RPW Intermittent Stream Channels and Adjacent Wetlands (draining to Blaine Creek)

Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14. doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59. doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007) Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels. Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x

[7] Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013)

B. ADDITIONAL COMMENTS TO SUPPORT JD: The three (3) wetlands, totaling 0.10 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to two unnamed intermittent (RPW) tributaries of Blaine Creek (Streams 31 and 32). Blaine Creek flows into the Big Sandy River (a TNW). The two intermittent stream channels function as headwater tributaries.

INTERMITTENT STREAMS AND WETLANDS DRAINING TO BLAINE CREEK BELOW HORSEFORD CREEK DAM WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet or acres)	HUC	Quad
Stream 31	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188061	-82.630791	371	Big Sandy	Fallsburg
Stream 32	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.188102	-82.631772	315	Big Sandy	Fallsburg
Wetland 11	PEM Wetland	38.187827	-82.632687	0.05	Big Sandy	Fallsburg
Wetland 12	PEM Wetland	38.188183	-82.631769	0.02	Big Sandy	Fallsburg
Wetland 13	PEM Wetland	38.187824	-82.631001	0.03	Big Sandy	Fallsburg
otal: 2 stream	s, 3 wetlands			Streams: 686 acre	linear feet; We	tlands: 0.10

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

- **REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14** A.
- DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8 B.

PROJECT LOCATION AND BACKGROUND INFORMATION: C.

State: Kentucky County/parish/borough: Lawrence County City: Louisa

Center coordinates of site (lat/long in degree decimal format): Lat. 38.182151 N, Long -82.630658 W.

Universal Transverse Mercator:

Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River

Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- V Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different 0 ID form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- 1 Office (Desk) Determination. Date: August 1, 2014
- Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Г Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- E Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Г Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: linear feet: width (ft) and/or acres. Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):³
- The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 V C.F.R. § 328.3(a)(8) of our regulations, such waters are not considered to be jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

³ Boxes checked below shall be supported by completing the appropriate sections in Section III below. ² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.A.1 and Section III.A.1 and Z and Section III.A.1 and Z and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

 General Area Conditions: Watershed size: Drainage area:

> Average annual rainfall: Average annual snowfall:

(ii) Physical Characteristics:

- (a) Relationship with TNW:
 - Tributary flows directly into TNW.
 - Tributary flows through tributary before entering TNW.

Project waters are river miles from TNW. Project waters are river miles from RPW. Project waters are aerial (straight) miles from TNW. Project waters are aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is:
Natural

Artificial (man-made). Explain:

Manipulated (man-altered). Explain:

Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West, ⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	Ave	ry properties with rage width: rage depth: rage side slopes:	respect	to top of bank	c (estimate):					
	Primary	tributary substrate Silts	compos	ition (check a Sands	all that app	ly):	Concrete				
	Ē	Cobbles	F	Gravel		i i i					
	-	Bedrock		Vegetation.	Tune/0/		WIGER				
	Г	Other, Explain:	detritus	vegetation.	Type/76 C	over.					
	Presence	<pre>/ condition/stabili of run/riffle/poo / geometry: / gradient (approx)</pre>	complex	kes. Explain:		g banks], Exj	olain:				
(c)	<u>Flow:</u> Tributary provides for: Estimate average number of flow events in review area/year: Describe flow regime: Other information on duration and volume:										
	Surface flow is: Characteristics:										
	Subsurface flow: Explain findings:										
	ר	 □ leaf litter dis □ sediment de □ water stainin □ other (list): □ Discontinuous (all indic l line imp ne charac natted doo turbed of position ng DHWM. ⁷	eators that app pressed on the ter of soil wn, bent, or a r washed awa Explain:	bank [] [] bsent [] y [] []	destruction of the presence sediment sor scour multiple obs abrupt chang	erved or predicted fl te in plant communit	low events			
	G	High Tide Line I oil or scum I fine shell or I physical ma I tidal gauges	indicated ine along debris de	l by: g shore object eposits (forest	Г M s Г	ean High Wat survey to av physical mar	er Mark indicated by ailable datum;	y:			
(iii) Ch		cher (list):									

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: acres
 - Wetland type. Explain:
 - Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Explain:

Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

- □ Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - ► Directly abutting
 - Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW. Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Cher environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Approximately (#) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- □ Tributary waters:
- Cher non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- □ Tributary waters:
- Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area:

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED (INTERSTATE OR INTRA-STATE) WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - Image: Image: maintenance of the second se
 - [from which fish or shell fish are or could be taken and sold in interstate or foreign commerce.
 - | which are or could be used for industrial purposes by industries in interstate commerce.
 - ☐ Interstate isolated waters. Explain:
 - □ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.

Identify type(s) of waters:

- Wetlands: acres.
- "See Footnote # 3.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category. Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos

Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

[&]quot; To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above): The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 C.F.R. § 328.3(a)(8), such waters are not considered to be considered jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.

г

- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: Four wetlands totaling .

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands:

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - □ State/Local wetland inventory map(s):
 - FEMA/FIRM maps: 21127C0120D
 - [100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
 - Previous determination(s). File no. and date of response letter:
 - ☐ Applicable/supporting case law:

FI

- ☐ Applicable/supporting scientific literature:
- C Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The 130-acre Fly Ash Pond was constructed as required by other sections of the Clean Water Act to treat coal ash waste water. Per 33 C.F.R. § 328.3(a)(8), such waters are not considered to be considered jurisdictional "waters of the United States." In addition, one (1) emergent wetland (Wetland 08) totaling 0.04 acre is located within the limits of the maximum operating pool

Louisville District, LRL-2014-417-mdh, Fly Ash Pond and Wetland 8

elevation (e.g., 705 feet) for the fly ash waste water treatment pond. Since the wetland falls within the permitted limits of this water, it is also not considered to be a jurisdictional water of the United States per 33 C.F.R. § 328.3(a)(8).

1.1.1.1.1.

Fly Ash Pond, 130 acres, Lat. 38.182151 N, Long -82.630658 W W8 (Emergent), 0.04 acres, Lat. 38.18342 N, Lon. -82.638723 W

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

- A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14
- B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-68

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

County/parish/borough: Lawrence County State: Kentucky City: Louisa

Center coordinates of site (lat/long in degree decimal format): Lat. 38.175615 °, Long. -82.647681 ° Universal Transverse Mercator:

Name of nearest waterbody: Fuller's Branch

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- 2 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different V JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

V Office (Desk) Determination. Date: July 24, 2014

Г Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Г Waters subject to the ebb and flow of the tide.
- -Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

1. Waters of the U.S.

- a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- V Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: One (1) perennial stream channel totaling 1,381 linear feet: 14 width (ft). Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM
 - Elevation of established OHWM (if known):
- 2. Non-regulated waters/wetlands (check if applicable):³
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Г Explain:

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-68

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.
² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Drainage area: Big Sandy River: 410.4 square miles

Average annual rainfall: 50.0 inches Average annual snowfall: 21.0 inches

(ii) Physical Characteristics:

- (a) Relationship with TNW:
 - Tributary flows directly into TNW.
 - Tributary flows through 1 tributaries before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 1 (or less) aerial (straight) miles from TNW. Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: S-68 (Perennial RPW) flows into Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW).

Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

Louisville District, LRL-2014-417-mdh. Perennial RPW Stream Channel S-68

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West. ⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	Ave		h: 6 inches slopes: 2:1										
	Primary	Primary tributary substrate composition (check all that apply):											
	Г	Silts	F	Sands		Г	Concrete						
	A	Cobbles	V	Gravel		Г	Muck						
	V	Bedrock	Г	Vegetation.	Type/% c	over:							
	5	Other. E:	xplain: Boulder	s									
	Presence Tributary	of run/rif		xes. Explain: aight	Run/riffle/		in: Moderately stable, partially vegetated present: Riffle 45%, Run: 30%, Pool: 25%						
(c)	Tributary Estimate Des	average n cribe flow	for: Perennial f number of flow regime: Perenn on duration and	events in revie nial	ew area/yea	ur: 20 (or greater)						
	Surface flow is: Confined Characteristics:												
	Subsurface flow: Unknown Explain findings:												
	Fributary has (check all that apply): ↓ Bed and banks												
	OHWM ⁶ (check all indicators that apply):												
		I clear,	, natural line im	pressed on the	bank 🔽	the presence of	litter and debris						
		C chang	ges in the chara	cter of soil	2	destruction of t	errestrial vegetation						
		T shelv	ing		F	the presence of	fwrack line						
		T veget	tation matted do	wn, bent, or a	ibsent Γ	sediment sortin	ng						
			itter disturbed o	r washed awa	y FI	scour							
			nent deposition		শ		ved or predicted flow events						
			r staining		LI.	abrupt change	in plant community						
	□ other (list):												
	Discontinuous OHWM. ⁷ Explain:												
			n the OHWM w le Line indicate				WA jurisdiction (check all that apply): Mark indicated by:						
		l oil or	scum line alon	g shore object	ts T	survey to avail	able datum;						
		[fine s	shell or debris d	eposits (foresl	hore) Γ	physical marki	ngs;						
		physic	ical markings/cl	naracteristics	F	vegetation line	s/changes in vegetation types.						
		T tidal	gauges										

(iii)

1.1

Louisville District. LRL-2014-417-mdh. Perennial RPW Stream Channel S-68

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: acres
 - Wetland type. Explain:
 - Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Explain: Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

- Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - ☐ Directly abutting
 - Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - □ Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW. Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- □ Vegetation type/percent cover. Explain:
- □ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from steep slope.
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: one perennial stream totaling 1,381 linear feet; 14 (ft) width.

Other non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - □ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - [] Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- C Other non-wetland waters: acres.

Identify type(s) of waters:

- Wetlands: acres.
- See Footnote # 3.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-68

To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.

n - 1

- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (fl).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - C Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - IV USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - □ State/Local wetland inventory map(s):
 - FEMA/FIRM maps: 21127C0120D
 - [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections
 - Previous determination(s). File no. and date of response letter:
 - Applicable/supporting case law:

- ☐ Applicable/supporting scientific literature:
- □ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: One (1) perennial stream channel, totaling 1,381 feet, functions as a headwater tributary (RPW). Stream 68 flows to Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW).

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 68	Unamed Perennial Tributary of Fuller's Branch	38.175615 -82.647681		1,381	Big Sandy	Fallsburg
Total: 1				1,381 linear fee	t	

PERENNIAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

Sec. 14

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

8.1

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel (S-B. 30) and Abutting Wetland (W-10)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38.188125 °, Long. -82.633499 ° Universal Transverse Mercator:

Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different V JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- Office (Desk) Determination. Date: June 9, 2014
- F Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Г Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Г Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Г Wetlands adjacent to TNWs
- V Relatively permanent waters2 (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs r
 - V Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs r
 - ï Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Г Impoundments of jurisdictional waters
 - Г Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: One (1) perennial stream channel totaling 558 linear feet: 8 width (ft). Wetlands: One (1) PEM wetland totaling 0.02 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):3
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Г Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below. ² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel (S-30) and Abutting Wetland (W-10)

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.A.1 and Section III.A.1 and Z and Section III.A.1 and Z and Section III.D.1.; otherwise, see Section III.B below.

I. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section 111.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section 111.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Drainage area: Big Sandy River: 410.4 square miles

Average annual rainfall: 50.0 inches Average annual snowfall: 21.0 inches

(ii) Physical Characteristics:

- (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - Tributary flows through I tributaries before entering TNW.

Project waters are 2-3 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW, Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: Stream-30 flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW). Tributary stream order, if known: 1st

(b) General Tributary Characteristics (check all that apply):

Tributary is: Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain: Flows from dam outfall, rip rap on streambanks, multiple dams and a culvert on stream

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

³ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel (S-30) and Abutting Wetland (W-10)

Tributary properties with respect to top of bank (es
--

Average width: 6.5 feet

Average depth: 18 inches

Average side slopes:

Primary tributary substrate composition (check all that apply):

P	Silts	V	Sands	F	Concrete
2	Cobbles	V	Gravel	Г	Muck
Г	Bedrock	Г	Vegetation. Type/% cover:		

V Other, Explain: Boulders

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Banks shored by rip rap, some herbaceous vegetation

Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes present: Riffle 40%, Run: 50%, Pool: 10% Tributary geometry: Relatively straight Tributary gradient (approximate average slope): %

Flow (c)

104.
ributary provides for: Perennial flow
stimate average number of flow events in review area/year: 20 (or greater)
Describe flow regime: Perennial
Other information on duration and volume:

Surface flow is: Confined Characteristics

Subsurface flow: Unknown Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

- F Bed and banks
- OHWM⁶ (check all indicators that apply):
- clear, natural line impressed on the bank 🔽 the presence of litter and debris
 - Changes in the character of soil destruction of terrestrial vegetation [] shelving
 - П the presence of wrack line
 - vegetation matted down, bent, or absent sediment sorting
 - I leaf litter disturbed or washed away **FI** scour Sediment deposition
 - multiple observed or predicted flow events
 - □ abrupt change in plant community
- □ water staining □ other (list):
- □ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- High Tide Line indicated by: Mean High Water Mark indicated by:
 - oil or scum line along shore objects Survey to available datum;
 - [] fine shell or debris deposits (foreshore) F) physical markings;
 - Physical markings/characteristics vegetation lines/changes in vegetation types.
 - □ tidal gauges
 - Γ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water is opaque, sludge deposits present

Identify specific pollutants, if known: KPDES-permitted discharge location for fly ash wastewater treatment pond.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel (S-30) and Abutting Wetland (W-10)

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. 7Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width): Herbaceous <20 ft.
- Wetland fringe. Characteristics: Wetland-10 Emergent wetland abutting stream.
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties: Wetland size: 0.02 acres Wetland type. Explain: Emergent vegetation Wetland quality. Explain: Low-quality, ORAM Category 1 wetland Project wetlands cross or serve as state boundaries. Explain:

(b) <u>General Flow Relationship with Non-TNW</u>; Flow is: Perennial Flow Explain:

> Surface flow is: Confined Characteristics:

Subsurface flow: Unknown Explain findings:

- [] Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting
 - Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are 2-5 river miles from TNW. Project waters are 1-2 aerial (straight) miles from TNW. Flow is from: Wetland to Navigable Waters Estimate approximate location of wetland is within the 50 - 100-year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Surface water not observed in wetland. Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): Emergent, <20 ft width
- IV Vegetation type/percent cover. Explain: Herbaceous/pem type >100% cover.
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - □ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: The wetlands and adjacent stream provide terrestrial and aquatic wildlife habitat.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: I Approximately (0.02) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres			
Wetland-10 Y	0.02			

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed: This wetland performs multiple functions including streambank stability, pollution control through filtering, and a source of wildlife habitat. The wetland has the capacity to transfer nutrients and organic carbon to support downstream foodwebs.

C. SIGNIFICANT NEXUS DETERMINATION

Ĩ

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below;

- Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain
 findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - □ TNWs: linear feet width (ft), Or, acres.
 - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from fly ash wastewater treatment pond discharge.
- □ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: One (1) perennial stream totaling 558 linear feet; 6.5 width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - [□] Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- T Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Boundaries of Wetland-10 include streambank of Stream-30.
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.02 acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - √ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - ☐ Interstate isolated waters. Explain:
 - Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- □ Tributary waters: linear feet width (ft).
- ►I Other non-wetland waters: acres.

Identify type(s) of waters:

- Wetlands: acres.
- See Footnote # 3.

[&]quot;To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- □ Lakes/ponds: acres.
 □
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:.
- Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - I▼ Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - VI USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle
 - ☐ State/Local wetland inventory map(s):
 - FEMA/FIRM maps: 21127C0110D
 - [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections
 - Previous determination(s). File no. and date of response letter:
 - [] Applicable/supporting case law:

- □ Applicable/supporting scientific literature:
- ☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The one (1) emergent wetland, totaling 0.02 acres, provides flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to an unnamed perennial (RPW) tributary of Blaine Creek. Blaine Creek flows into the Big Sandy River (a TNW). Stream 30 (RPW) is a perennial stream channel, totaling 558 linear feet, that functions as a headwater tributary to Blaine Creek.

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 30	Unamed tributary to Blaine Creek	38.188125	-82.633499	558	Big Sandy	Fallsburg
Wetland 10	PEM wetland	38.187993	-82.633528	0.02	Big Sandy	Fallsburg
Total: 1 Stream 1 Wetland			1	Stream: 558 linear feet Wetland: 0.02 acre		

PERENNIAL STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

- A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14
- DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-44 B.

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

County/parish/borough: Lawrence County State: Kentucky City: Louisa

Center coordinates of site (lat/long in degree decimal format): Lat. 38.18355 °, Long. -82.65165 °

Universal Transverse Mercator:

Name of nearest waterbody: Fly Ash wastewater treatment pond

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River via fly ash wastewater treatment pond

Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- 1 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different 2 JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- V Office (Desk) Determination. Date: July 24, 2014
- Г Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Г Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Г Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas 1
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs 1
- Non-RPWs that flow directly or indirectly into TNWs -
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- V Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: One (1) perennial stream channel totaling 2,379 linear feet: 12 width (ft). Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):³
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. F Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.
² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-44

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Sect

I. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Drainage area: Big Sandy River: 410.4 square miles

Average annual rainfall: 50.0 inches Average annual snowfall: 21.0 inches

- (ii) Physical Characteristics:
 - (a) Relationship with TNW:
 - Tributary flows directly into TNW.
 - Tributary flows through 1 tributaries before entering TNW.

Project waters are 2-5 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: Stream-44 (Horseford Creek) flows into the fly ash wastewater treatment pond, which flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW). Tributary stream order, if known:

- (b) General Tributary Characteristics (check all that apply):
 - Tributary is: 🔽 Natural
 - Artificial (man-made). Explain:
 - Manipulated (man-altered). Explain: Stream-44 drains into fly ash wastewater treatment pond.

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-44

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

¹ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	Ave	ry properties with a rage width: 6 feet rage depth: 6 inch- rage side slopes:		o top of bank (e	stimate)	5		
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	N	Silts	M	Sands		1		Concrete
		Cobbles	M	Gravel				Muck
	ঘ	Bedrock Other. Explain: B	F	Vegetation. T	ype/% co	over:		
	14	Other, Explain, E	outders					
	Presence Tributary		complex vely stra	tes. Explain: Ru ight	in/riffle/			in: Moderately stable, partially vegetated present: Riffle 60%, Run: 30%, Pool: 10%
(c)	Estimate Des	/ provides for: Pero average number o cribe flow regime: formation on durat	f flow e Perenn	vents in review ial	area/yea	r: 20 (or grea	ter	
	Surface I	flow is: Confined	Characte	eristics:				
		ce flow: Unknown Dye (or other) tes						
	and the second second	has (check all tha Bed and banks	at apply)	:				
	171	OHWM ⁶ (check	all indic	ators that apply):			
		Clear, natural	line imp	pressed on the ba	ank 🖂	the presence	of	litter and debris
		C changes in the	e charac	ter of soil	L)	destruction of	oft	errestrial vegetation
		□ shelving			П	the presence	of	wrack line
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	1.20							
		s other than the OF High Tide Line i			Second States	and the second second		WA jurisdiction (check all that apply): Mark indicated by:
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		[] physical mark			П	vegetation li	ine	s/changes in vegetation types.
		TI tidal gauges				1.5.1		
		□ other (list):						
Ch	emical Ch	aracteristics:						
			er color	is clear, discolo	red, oily	film; water c	qua	lity; general watershed characteristics, etc.).
		Water color is slig						and the second se

(iii)

Louisville District, LRL-2014-417-mdh, Perennial RPW Stream Channel S-44

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'
 - Wetland fringe. Characteristics:
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: These waters and their buffers provide aquatic and terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW
 - (i) Physical Characteristics:
 - (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: acres
 - Wetland type. Explain: Wetland quality. Explain:
 - Project wetlands cross or serve as state boundaries. Explain:
 - Project wenanus cross of serve as state boundaries. Explan
 - (b) <u>General Flow Relationship with Non-TNW</u>: Flow is: Explain:

Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

- ☐ Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - □ Directly abutting
 - □ Not directly abutting
 - □ Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW. Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- □ Riparian buffer. Characteristics (type, average width):
- □ Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - □ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Water fills >75% of available area, originates from steep slope.
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
 - Provide estimates for jurisdictional waters in the review area (check all that apply):
 - Tributary waters: 2,379 linear feet; 6 (ft) width.
 - Other non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW;
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - Γ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - F from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - ☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.

Identify type(s) of waters:

- Wetlands: acres.
- *See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category. Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Stream 44 drains directly into mammade fly ash wastewater treatment pond that does not drain into TNWs.
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams):
- Lakes/ponds:

1011103

- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft),
- □ Lakes/ponds: acres.
 □
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [] Office concurs with data sheets/delineation report.
 - C Office does not concur with data sheets/delineation report.
- □ Data sheets prepared by the Corps:
- □ Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- [7] U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.
- [♥] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- [] State/Local wetland inventory map(s):
- FEMA/FIRM maps: 21127C0120D
- [100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- Previous determination(s). File no. and date of response letter:
- ☐ Applicable/supporting case law:

- □ Applicable/supporting scientific literature:
- C Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: One (1) perennial stream channel, totaling 2,379 feet, functions as a headwater tributary (RPW). Stream 44 flows into Fly Ash Wastewater Treatment Pond, which flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW).

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 44	Horseford Creek	38.18353	-82.65165	2,379	Big Sandy	Fallsburg
Total: 1				2,379 linear feet		

PERENNIAL STREAMS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

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APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 23 Non-RPW Ephemeral Stream Channels (draining to Fuller's Branch)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa

Center coordinates of site (lat/long in degree decimal format): Lat. 38.174032°, Long. -82.647949 °

Universal Transverse Mercator:

Name of nearest waterbody: Fuller's Branch

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- Office (Desk) Determination. Date: June 9, 2014
- Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: Twenty-three (23) ephemeral stream channels totaling 5,163 linear feet. Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):³
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, 23 Non-RPW Ephemeral Stream Channels (draining to Fuller's Branch)

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

I. TNW Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY);

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Big Sandy River: 410.4 square miles Drainage area:

Average annual rainfall: 50.0 inches Average annual snowfall: 21.0 inches

- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - Tributary flows through 2-3 tributaries before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are 1 (or less) river miles from RPW. Project waters are 1 (or less) aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: Identify flow route to TNW⁵: Stream 59a flows to Stream 59 (unnamed ephemeral tribs), which flows to Stream 68 (perennial RPW). Stream 60a flows to Stream 60 (unnamed ephemeral tribs), which flows to Stream 58, Stream 69, and Streams 68a flow through Stream 68r which flows into Stream 68. Stream-68 (RPW) flows into Fuller's Branch (RPW), which flows into the Big Sandy River (a TNW). Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

- Manipulated (man-altered). Explain:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West. ⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

		rage depth: <1 rage side slope							
	Primary t	ributary substr	ate compo	sition (check a	all that app	ly):			
	1	Silts	V	Sands		ſ		Concrete	
	2	Cobbles	2	Gravel		г	ī.	Muck	
	E.	Bedrock	Ē	Vegetation.	Type/% c	over:			
	V	Other, Explain	n: detritus						
	Presence Tributary		ool comple latively Stu	xes. Explain: raight	High grad			in: High gradient, highly eroding, partially v run/riffle/pool complex	
(c)	Estimate Desc	provides for: average numbi cribe flow regi ormation on du	er of flow i me: Ephen	events in revie neral	ew area/yea	r: 20 (or grea	ater)	
	Surface flow is: Discrete and Confined Characteristics:								
	Subsurface flow: Unknown Explain findings:								
	ান	has (check all Bed and bank OHWM ⁶ (che	5	N	alv).				
		the second second second				the presence	eof	litter and debris	
		changes in						errestrial vegetation	
	10.00	shelving			Г	27. O. Chiefe			
			matted do	wn, bent, or a					
	1			r washed awa				-	
	1	sediment o	deposition		ান	multiple obs	serv	ved or predicted flow events	
	1	water stain						in plant community	
	1	other (list)	i:						
		□ Discontinuous OHWM. ⁷ Explain:							
	Common A.	other than the High Tide Lin			and the second se			WA jurisdiction (check all that apply): Mark indicated by:	
	1	oil or scur	n line alon	g shore object	is TI	survey to av	aila	able datum;	
	1	fine shell	or debris d	eposits (foresl	hore) \Box	physical ma	rkit	ngs;	
	1	physical n	narkings/cl	haracteristics	Г	vegetation l	ines	s/changes in vegetation types.	
		tidal gaug	es			1.00			
	1	I close Page							

Explain: Less than 1 foot of water was observed. Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): Mixed mesic forest, >50'
 - Wetland fringe. Characteristics:
 - Habitat for:
 - ☐ Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW
- (i) Physical Characteristics:
 - (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: acres
 - Wetland type. Explain:
 - Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Explain: Surface flow is:

Characteristics:

Subsurface flow: Explain findings:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting
 - Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are river miles from TNW.

Project waters are aerial (straight) miles from TNW. Flow is from:

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- □ Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- □ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain
 findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: Based on the
 aforementioned findings, the twenty-three (23) ephemeral tributaries function as headwater stream channels providing water, nitrogen,
 and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These
 functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting
 scientific literature under Section IV, A.
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D.
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:

TNWs: linear feet width (ft), Or, acres.

- ✓ Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

- T I Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
 - Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: Twenty-three (23) ephemeral stream channels totaling 5,163 linear feet.
- Cher non-wetland waters: acres. Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - □ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - [] from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - I which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.

Identify type(s) of waters:

- ✓ Wetlands: acres.
- See Footnote # 3.

[&]quot;To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [7] Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - □ Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.

- USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.
- [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- [] State/Local wetland inventory map(s):
- FEMA/FIRM maps: 21127C0120D
- [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:
 - Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)

Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14. doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59. doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007) Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.

Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The twenty (23) ephemeral stream channels, totaling 5,163 feet, function as headwater tributaries (Non-RPW) which flow into a perennial stream (Stream 68), which flow into Fuller's Branch (RPW), which flow into the Big Sandy River (TNW).

EPHEMERAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

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TD #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
Stream 58	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174032	-82.647949	604	Big Sandy	Fallsburg
Stream 59	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174786	-82.646863	881	Big Sandy	Fallsburg
Stream 59a	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174412	-82.646894	304	Big Sandy	Fallsburg
Stream 60	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.176137	-82.646625	692	Big Sandy	Fallsburg
Stream 60a	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.175762	-82.647063	149	Big Sandy	Fallsburg
Stream 68a	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174678	-82.648721	92	Big Sandy	Fallsburg
Stream 68b	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.17473	-82.648255	62	Big Sandy	Failsburg
Stream 68c	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.17447	-82.648223	224	Big Sandy	Fallsburg
Stream 68d	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.175023	-82.647836	158	Big Sandy	Fallsburg
Stream 68e	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174797	-82.648466	69	Big Sandy	Fallsburg
Stream 68f	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.175329	-82.647784	68	Big Sandy	Fallsburg
Stream 68g	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.174959	-82.648427	130	Big Sandy	Fallsburg
Stream 68h	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.17541	-82.647479	200	Big Sandy	Fallsburg
Stream 68i	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.17517	-82.648242	104	Big Sandy	Fallsburg
Stream 68j	Unamed Ephemeral (Non- RPW) Tributary of Fuller's	38.175685	-82.647456	102	Big Sandy	Failsburg

ID #	Description/Tribuary Name	Latitude	Longitude	Size (linear feet)	HUC	Quad
	Branch					
Stream 68k	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.175554	-82.647476	139	Big Sandy	Fallsburg
Stream 681	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.177244	-82.647641	65	Big Sandy	Fallsburg
Stream 68m	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.177145	-82.647626	85	Big Sandy	Fallsburg
Stream 68n	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.177322	-82.647374	204	Big Sandy	Fallsburg
Stream 680	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.176957	-82.647088	256	Big Sandy	Fallsburg
Stream 68p	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.1764	-82.647351	58	Big Sandy	Fallsburg
Stream 68q	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.176428	-82.646887	251	Big Sandy	Fallsburg
Stream 68r	Unamed Ephemeral (Non- RPW) Tributary of Fuller's Branch	38.176653	-82.647099	266	Big Sandy	Fallsburg
Fotal: 23 S	Streams			5,163	Linear Feet	

EPHEMERAL STREAMS DRAINING TO FULLER'S BRANCH WITHIN THE BIG SANDY POND CLOSURE PROJECT

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APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

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A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38.179566°, Long -82.625246° Universal Transverse Mercator:

Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- I Office (Desk) Determination. Date: June 9, 2014
- Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "vaters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
- b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: Twenty (20) ephemeral stream channels totaling 3,804 linear feet. Wetlands: Two (2) (one emergent and one emergent/scrub-shrub) wetlands totaling 0.14 acres.
- c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):3
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months), ³ Supporting documentation is presented in Section III.F.

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Louisville District, LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.A.1 and Section III.A.1 and 2 and Section III.A.1, otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

 General Area Conditions: Watershed size: Big Sandy Watershed: 410.4 square miles. Drainage area:

Average annual rainfall: 50 inches Average annual snowfall: 21 inches

- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - Tributary flows through 2-3 tributary before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are 1 (or less) river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: Identify flow route to TNW⁵: Streams 78a, 78b, 78c flow into Stream 78 (an ephemeral trib, which flows into Stream 4). Streams 79a and 79aa flow into Stream 79 (an ephemeral trib), which flows into Stream 80 flows into Stream 80 (an ephemeral trib), which flows into Stream 4. Streams 5, 26, 27, 28, 29, 72, 73, 74, 75, 76 & 77 flow into Stream 4. Stream 4 (a perennial RPW) flows into Blaine Creek (RPW), which flows into the Big Sandy River (a TNW). (see sheet 7 for information on Stream 4). Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

Artificial (man-made). Explain: Stream originates at dam outfall.

Manipulated (man-altered). Explain:

Louisville District, LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

-2-

^{*} Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary	properties	with respe	ect to top of	f bank	(estimate):
-----------	------------	------------	---------------	--------	-------------

Average width: <1 foot

Average depth: <1 foot

Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

V	Silts		Sands	Г	Concrete
V	Cobbles	F	Gravel	Г	Muck
Г	Bedrock	F	Vegetation. Type/% cover:		

1 Other. Explain: detritus

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: High gradient, highly eroding. Presence of run/riffle/pool complexes. Explain: High gradient streams. No run/riffle/pool complexes. Tributary geometry: Relatively Straight Tributary gradient (approximate average slope): 45%

(c) Flow:

Tributary provides for: Ephemeral Flow Estimate average number of flow events in review area/year: 20 (or greater) Describe flow regime: Ephemeral

Other information on duration and volume:

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

- Bed and banks
- OHWM⁶ (check all indicators that apply):
 - IV clear, natural line impressed on the bank □ the presence of litter and debris
 - Changes in the character of soil destruction of terrestrial vegetation
 - □ shelving T the presence of wrack line
 - sediment sorting Vegetation matted down, bent, or absent
 - leaf litter disturbed or washed away
 - SCOUT [] sediment deposition multiple observed or predicted flow events
 - abrupt change in plant community

□ other (list):

□ water staining

Discontinuous OHWM.7 Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): Mean High Water Mark indicated by:

- High Tide Line indicated by: [] oil or scum line along shore objects
 - Survey to available datum:
 - Г fine shell or debris deposits (foreshore) physical markings;
 - physical markings/characteristics
- vegetation lines/changes in vegetation types.

- [] tidal gauges
- □ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Acid Mine Drainage (AMD) appeared to be present (orange coloration in water). Identify specific pollutants, if known: AMD appeared to be present

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. 7Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): Mixed Mesic forest, 6-20 meters
 - Wetland fringe. Characteristics: Wetland 15 is adjacent to Str. 5; and Wetland 16 abutting Str. 26 and 27.
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties:

Wetland size: 0.14 acres

Wetland type, Explain: Emergent and Emergent/Scrub-Shrub Wetland quality. Explain: low to medium (ORAM Cat. 1 and 2)

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Ephemeral Flow Explain:

Surface flow is: Overland Sheetflow Characteristics:

Subsurface flow: Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting
 - Not directly abutting
 - Discrete wetland hydrologic connection. Explain: Wetland 15 was created from hydrology from dam outfall.
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are 1-2 river miles from TNW. Project waters are 1-2 aerial (straight) miles from TNW. Flow is from: Wetland to Navigable Waters

Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland appeared to be impacted by AMD.

Identify specific pollutants, if known: AMD appeared to be present

(iii) Biological Characteristics. Wetland supports (check all that apply):

- IV Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.</p>
- Vegetation type/percent cover. Explain: herbaceous 80-100%; scrub-shrub 20-30%.
- Habitat for:
 - Federally Listed species. Explain findings:
 - □ Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 2 Approximately (0.14) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-15 N	0.06	and the second	
W-16 Y	0.08		
W-16 Y	0.08		

Summarize overall biological, chemical and physical functions being performed: These wetlands perform numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands have the capacity to transfer nutrients and organic carbon to support downstream food-webs. The wetlands have a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain
 findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the two (2) emergent and emergent/scrub shrub wetlands, totaling 0.14 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 5, 26, and 27. The twenty (20) ephemeral tributaries function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TINWs: linear feet width (ft), Or, acres.
 - □ Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- T Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: Twenty (20) ephemeral stream channels totaling 3,804 linear feet.
- □ Other non-wetland waters: acres.
 - Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: Two (2) wetlands totaling 0.14 acres.

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - First from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - Interstate isolated waters. Explain:
 - □ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:
- Wetlands: acres.
- See Footnote # 3.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

Г

- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.
 - T Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - IF| Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.

- IVICUUS VICTOR IN CONTRACT
- U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey.
- [7] National wetlands inventory map(s). Cite name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
- ☐ State/Local wetland inventory map(s):
- FEMA/FIRM maps: 21127C0120D
- [100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- Previous determination(s). File no. and date of response letter:
- IVI Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007)

Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14.

Louisville District. LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59. doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007) Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels. Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x

□ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The two (2) wetlands, totaling 0.14 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to an unnamed ephemeral (Non-RPW) tributaries of Blaine Creek. Twenty (20) ephemeral stream channels, totaling 3,084 feet, function as headwater tributaries (Non-RPW), which flow into a perennial stream (Stream 4), which flow into Blaine Creek (RPW), which flow into the Big Sandy River (TNW).

EPHEMERAL STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID#	Description/Tribuary Name	Latitude	Longitude	Size (linear feet or acres)	HUC	Quad
Stream 05	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179566	-82.625246	70	Big Sandy	Fallsburg
Stream 26	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179403	-82.624443	178	Big Sandy	Pritchard
Stream 27	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.179562	-82.624478	154	Big Sandy	Pritchard
Stream 28	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18034	-82.624501	185	Big Sandy	Pritchard
Stream 29	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.180985	-82.624289	138	Big Sandy	Pritchard
Stream 72	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.181433	-82.624959	175	Big Sandy	Fallsburg/Pricharc
Stream 73	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182305	-82.625104	210	Big Sandy	Fallsburg/Prichard
Stream 74	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184755	-82,626268	336	Big Sandy	Fallsburg
Stream 75	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185768	-82.626399	108	Big Sandy	Fallsburg
Stream 76	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186226	-82.626544	385	Big Sandy	Fallsburg
Stream 77	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.185364	-82.625733	36	Big Sandy	Fallsburg
Stream 78	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183861	-82.624616	354	Big Sandy	Pritchard
Stream 78a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183771	-82.624265	120	Big Sandy	Pritchard
Stream 78b	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.183921	-82.62445	61	Big Sandy	Pritchard
Stream 78c	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.184067	-82.624865	96	Big Sandy	Pritchard

Louisville District, LRL-2014-417-mdh, 20 Non-RPW Ephemeral Stream Channels and 2 Adjacent Wetlands (draining to Blaine Creek)

-8-

Total: 20 str	eams, 2 wetlands	Stream: 3,804 linear feet ; Wetlands: 0.14 acr				
Wetland 16	PEM/PSS Wetland	38.179511	-82.624825	0.08	Big Sandy	Pritchard
Wetland 15	PEM Wetland	38.179389	-82.625917	0.06	Big Sandy	Fallsburg
Stream 80a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.18624	-82.62678	80	Big Sandy	Fallsburg
Stream 80	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.186308	-82.626727	132	Big Sandy	Fallsburg
Stream 79aa	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182373	-82.622941	53	Big Sandy	Pritchard
Stream 79a	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182473	-82.623487	391	Big Sandy	Pritchard
Stream 79	Unamed Ephemeral (Non-RPW) Tributary of Blaine Creek	38.182304	-82.623863	542	Big Sandy	Pritchard

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APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, 92 Non-RPW Ephemeral Stream B. Channels and 3 Adjacent Wetlands (draining to Fly Ash Pond)

PROJECT LOCATION AND BACKGROUND INFORMATION: C.

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38.18278°, Long. -82.642085°

Universal Transverse Mercator: Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- 1 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different D JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- V Office (Desk) Determination. Date: July 24, 2014
- Г Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Г Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Г Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area, [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas F
- Wetlands adjacent to TNWs
- Relatively permanent waters2 (RPWs) that flow directly or indirectly into TNWs T
- 1 Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- T Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - 2 Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands F
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: Ninety-two (92) ephemeral stream channels, totaling 16,319 feet linear feet, Wetlands: Three (3) wetlands totaling 0.15 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM
 - Elevation of established OHWM (if known):
 - 2. Non-regulated waters/wetlands (check if applicable):³
 - Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Г Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.
² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.A.1 and Section III.A.1 and 2 and Section III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

 General Area Conditions: Watershed size: Big Sandy Watershed: 410.4 square miles Drainage area:

Average annual rainfall: 50 inches Average annual snowfall: 21 inches

(ii) Physical Characteristics:

- (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - ✓ Tributary flows through 3-4 tributary before entering TNW.

Project waters are 2-5 river miles from TNW. Project waters are 1-2 river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: All of the 92 ephemeral streams listed either directly flow into the fly ash wastewater treatment pond or are a tributary to a stream that flows into the wastewater treatment pond. The fly ash pond flows into Stream 30 (a perennial RPW), which flows into Blaine Creek (a perennial RPW), which flows into the Big Sandy River (a TNW). Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

^{*}Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Louisville District, LRL-2014-417-mdh, 92 Non-RPW Ephemeral Stream Channels and 3 Adjacent Wetlands (draining to Fly Ash Pond)

	Ave	ry properties with rage width: 2 feet rage depth: 2 incl rage side slopes:	nes	to top of bank	t (estimate)	5	
	Primary I	tributary substrate Silts	compos	sition (check a Sands	all that app	ly):	Concrete
	2	Cobbles	P	Gravel		Г	Muck
	Г	Bedrock	Г	Vegetation.	Type/% c	over:	
	Г	Other. Explain:					
	Presence Tributary		comple, ole, see f	xes. Explain: forms	High grad		in: variable, see forms run/riffle/pool complex
(c)	Estimate Des	provides for: Ep average number cribe flow regime formation on dura	of flow of flow of flow of flow of flow of the flow of	events in revie neral	ew area/yea	ur: 20 (or greater))
	Surface f	low is: Characte	ristics:				
		ce flow: Unknow Dye (or other) te		and a second			
		has (check all th Bed and banks	at apply):			
	ান	OHWM ⁶ (check	all indi	cators that app	oly):		
		Clear, natural	line im	pressed on the	bank Г	the presence of	litter and debris
		C changes in th	e charac	cter of soil	EL.	destruction of the	errestrial vegetation
	1	Shelving			П	the presence of	wrack line
		Vegetation m	atted do	wn, bent, or a	bsent []	sediment sortin	g
		[leaf litter dis	turbed o	r washed awa	y FI	scour	
		□ sediment dep	osition		17	multiple observ	ed or predicted flow events
		[] water stainin	g			abrupt change i	n plant community
		other (list):					
		Discontinuous C	HWM.	⁷ Explain:			
		other than the O High Tide Line					WA jurisdiction (check all that apply): Mark indicated by:
				g shore object		survey to availa	
				eposits (foresh		physical marking	
		T physical mar		Contraction of the second		A state of the second second second	s/changes in vegetation types.
		☐ tidal gauges			-		Contraction of the second s
		□ other (list):					
Che	mical Ch	aracteristics:					

(iii)

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water color observed was generally clear. Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. 7Ibid.

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): Mixed mesic forest >50'
 - Wetland fringe. Characteristics: Stream 44a has two (2) abutting wetlands (Wetland 01 and 02). Stream 50 has one (1) abutting wetland (Wetland 09).
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: 0.15 acres

Wetland type. Explain: Emergent/Scrub-Shrub

Wetland quality. Explain: Low

Project wetlands cross or serve as state boundaries. Explain:

(b) <u>General Flow Relationship with Non-TNW</u>: Flow is: No Flow Explain:

ion is no non Explan.

Surface flow is: Characteristics:

Subsurface flow: Explain findings:

- T Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting
 - Not directly abutting
 - □ Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - √ Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are 2-5 river miles from TNW. Project waters are 1-2 aerial (straight) miles from TNW.

Flow is from: No Flow

Estimate approximate location of wetland as within the 500-year or greater floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Water was not noted on wetland forms.

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- [7] Riparian buffer. Characteristics (type, average width): The wetlands provide narrow buffers < 50'.
- Vegetation type/percent cover. Explain: herbaceous: 50%, sapling/shrub: 50%.
- P Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 3 Approximately (0.15) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N) W-01 Y	Size (in acres) 0.06	Directly abuts? (Y/N)	Size (in acres)	
W-02 Y	0.03			
W-09 Y	0.06			

Summarize overall biological, chemical and physical functions being performed: These wetlands perform limited functions including erosion and sediment control, pollution control through filtering and providing wildlife habitat.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Based on the aforementioned findings, the three (3) emergent and emergent/scrub shrub wetlands (W1, W2 & W9), totaling 0.15 acres, provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 44a and Stream 50. The ninety-two (92) ephemeral tributaries (see Table 1 under Section IV, B for list) function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - ✓ Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- T Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres. Identify type(s) of waters:

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - [♥] Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: Ninety-two (92) ephemeral stream channels, totaling 16,319 feet linear feet.
- Other non-wetland waters: acres. Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- ✓ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- [□] Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: 3 wetlands totaling 0.15 acres

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED |INTERSTATE OR INTRA-STATE| WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - [] from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - I which are or could be used for industrial purposes by industries in interstate commerce.
 - □ Interstate isolated waters. Explain:
 - C Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.

Identify type(s) of waters:

NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

E.

See Footnote # 3.

[&]quot;To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos

- Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams):
- T Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands:

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal.
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [7] Office concurs with data sheets/delineation report.
 - □ Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - VI USGS NHD data.

- [7] USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
- [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.
- State/Local wetland inventory map(s):
- FEMA/FIRM maps: 21127C0120D
- [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: [] Aerial (Name & Date):
 - or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- Previous determination(s). File no. and date of response letter:
- [▼] Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007) Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14. doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59.

doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007)

Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels.

Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x

[7] Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013).

B. ADDITIONAL COMMENTS TO SUPPORT JD: The three (3) emergent and emergent/scrub shrub wetlands (W1, W2 & W9), totaling 0.15 acres, provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to Streams 44a and Stream 50. The ninety-two (92) ephemeral tributaries (see Table 1 under Section IV, B for list) function as headwater stream channels providing water, nitrogen, and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (a TNW) and thus establish a significant nexus to this TNW.

TABLE 1

EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

1D #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 01	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18278	-82.642085	402	Big Sandy	Fallsburg
Stream 01a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18292	-82.642209	176	Big Sandy	Fallsburg
Stream 02	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182358	-82.641507	411	Big Sandy	Fallsburg
Stream 02a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182345	-82.641158	157	Big Sandy	Fallsburg
Stream 03	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182731	-82.642327	313	Big Sandy	Fallsburg
Stream 06	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180497	-82.640554	170	Big Sandy	Fallsburg
Stream 07	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18074	-82.64076	278	Big Sandy	Fallsburg
Stream 08	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182257	-82.642054	101	Big Sandy	Fallsburg
Stream 09	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182792	-82.64174	479	Big Sandy	Failsburg
Stream 09a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182594	-82.641687	119	Big Sandy	Fallsburg
Stream 09b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182694	-82,64161	194	Big Sandy	Fallsburg
Stream 10	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183665	-82.644132	95	Big Sandy	Fallsburg
Stream 11a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18441	-82.643544	117	Big Sandy	Fallsburg
Stream 11b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184944	-82.643781	104	Big Sandy	Fallsburg
Stream 11c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184638	-82.64308	381	Big Sandy	Fallsburg
Stream 11d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184545	-82.64252	129	Big Sandy	Fallsburg
Stream 11e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184364	-82.644005	62	Big Sandy	Fallsburg
Stream 12	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184279	-82.644254	95	Big Sandy	Fallsburg

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TABLE 1
EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG
SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 13a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185804	-82.648927	56	Big Sandy	Fallsburg
Stream 13b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186405	-82.648953	306	Big Sandy	Fallsburg
Stream 13c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186111	-82.649453	185	Big Sandy	Fallsburg
Stream 14	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177507	-82.639347	183	Big Sandy	Fallsburg
Stream 15a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176481	-82.642261	47	Big Sandy	Fallsburg
Stream 15b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176163	-82.642182	104	Big Sandy	Fallsburg
Stream 15c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176046	-82.642318	173	Big Sandy	Fallsburg
Stream 15d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175778	-82.642329	245	Big Sandy	Fallsburg
Stream 15e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175752	-82.642651	61	Big Sandy	Fallsburg
Stream 15f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175687	-82.643729	646	Big Sandy	Fallsburg
Stream 15g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.175682	-82.643372	275	Big Sandy	Fallsburg
Stream 16	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17767	-82.642599	132	Big Sandy	Fallsburg
Stream 17a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179664	-82.644962	111	Big Sandy	Fallsburg
Stream 17b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.179373	-82.645296	112	Big Sandy	Fallsburg
Stream 17c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178786	-82.646264	233	Big Sandy	Fallsburg
Stream 18a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182426	-82.64647	93	Big Sandy	Fallsburg
Stream 18b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182388	-82.646877	100	Big Sandy	Fallsburg
Stream 18c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182425	-82.647548	113	Big Sandy	Fallsburg
Stream 18d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182362	-82.647975	87	Big Sandy	Fallsburg
Stream 18e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.648736	43	Big Sandy	Fallsburg
Stream 18f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182427	-82.64916	114	Big Sandy	Fallsburg
Stream 18g	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182275	-82.649426	69	Big Sandy	Fallsburg
Stream 19	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183625	-82.646425	182	Big Sandy	Fallsburg
Stream 20	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184248	-82.649346	740	Big Sandy	Fallsburg
Stream 20a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184416	-82.648381	81	Big Sandy	Fallsburg
Stream 20b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183988	-82.649448	138	Big Sandy	Fallsburg
Stream 20c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183736	-82.64961	294	Big Sandy	Fallsburg

-9-

TABLE I
EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG
SANDY POND CLOSURE PROJECT

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	HUC	Quad
Stream 21	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183258	-82.637508	84	Big Sandy	Fallsburg
Stream 23	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183783	-82.638926	165	Big Sandy	Fallsburg
Stream 23a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183776	-82.63877	77	Big Sandy	Fallsburg
Stream 24	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181997	-82.635548	177	Big Sandy	Fallsburg
Stream 25	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182203	-82.63839	415	Big Sandy	Fallsburg
Stream 33	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183828	-82.6441	64	Big Sandy	Fallsburg
Stream 34	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184202	-82.643787	141	Big Sandy	Fallsburg
Stream 34a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184134	-82.643645	100	Big Sandy	Fallsburg
Stream 35a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185921	-82.645834	211	Big Sandy	Fallsburg
Stream 35b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185204	-82.6465	78	Big Sandy	Fallsburg
Stream 36	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.177545	-82.638531	280	Big Sandy	Fallsburg
Stream 37	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.176969	-82.642526	171	Big Sandy	Fallsburg
Stream 38	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.17922	-82.644498	279	Big Sandy	Fallsburg
Stream 40	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1813	-82,645778	157	Big Sandy	Fallsburg
Stream 41a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18117	-82.646067	56	Big Sandy	Fallsburg
Stream 42	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182146	-82.648394	114	Big Sandy	Fallsburg
Stream 43	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184011	-82.647594	368	Big Sandy	Fallsburg
Stream 44a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.18488	-82.650217	554	Big Sandy	Fallsburg
Stream 44b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182484	-82.653843	633	Big Sandy	Fallsburg
Stream 44c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181227	-82.653997	232	Big Sandy	Fallsburg
Stream 45	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183078	-82.637348	93	Big Sandy	Fallsburg
Stream 47	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182258	-82.635048	48	Big Sandy	Fallsburg
Stream 48	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183095	-82.638419	73	Big Sandy	Fallsburg
Stream 49	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181963	-82.637701	109	Big Sandy	Fallsburg
Stream 50	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185788	-82.635826	116	Big Sandy	Fallsburg
Stream 51	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185756	-82.635877	75	Big Sandy	Fallsburg
Stream 52	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.181211	-82.628042	47	Big Sandy	Fallsburg

ID #	Description/Tributary Name	Latitude	Longitude	Size (linear feet - stream, acres - wetland)	нис	Quad
Stream 53	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182467	-82.627866	64	Big Sandy	Fallsburg
Stream 54	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182315	-82.627723	39	Big Sandy	Fallsburg
Stream 55	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184567	-82.629622	88	Big Sandy	Fallsburg
Stream 56	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178126	-82.633154	36	Big Sandy	Fallsburg
Stream 57	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178022	-82.630229	43	Big Sandy	Fallsburg
Stream 61	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.180213	-82.627552	31	Big Sandy	Fallsburg
Stream 62	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182122	-82.627641	70	Big Sandy	Fallsburg
Stream 63	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.182254	-82.627658	77	Big Sandy	Fallsburg
Stream 64	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.184825	-82.629898	77	Big Sandy	Failsburg
Stream 65	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185999	-82.630599	19	Big Sandy	Fallsburg
Stream 66	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186103	-82.630655	30	Big Sandy	Fallsburg
Stream 67	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.178037	-82.63036	51	Big Sandy	Fallsburg
Stream 70a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183487	-82.651216	75	Big Sandy	Fallsburg
Stream 70b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.183499	-82.650664	310	Big Sandy	Fallsburg
Stream 71a	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38,185856	-82.652998	262	Big Sandy	Fallsburg
Stream 71b	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38,18583	-82.653492	131	Big Sandy	Fallsburg
Stream 71c	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.186375	-82.654015	548	Big Sandy	Fallsburg
Stream 71d	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.1858	-82.654716	440	Big Sandy	Fallsburg
Stream 71e	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185899	-82.655866	81	Big Sandy	Fallsburg
Stream 71f	Unnamed Ephemeral (Non-RPW) Tributary to fly ash pond	38.185596	-82.655933	222	Big Sandy	Fallsburg
Wetland 01	PEM/PSS Wetland	38.185144	-82.65042	0.06	Big Sandy	Fallsburg
Wetland 02	PEM Wetland	38.184948	-82.650542	0.03	Big Sandy	Fallsburg
Wetland 09	PEM/PSS Wetland	38.185936	-82.635573	0.06	Big Sandy	Fallsburg

TABLE 1 EPHEMERAL STREAMS AND WETLANDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

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APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38.179875°, Long -82.625015° Universal Transverse Mercator:

Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☑ Office (Desk) Determination. Date: July 24, 2014
- Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: One (1) intermittent stream channel totaling 3,343 linear feet: 1' width (ft). Wetlands: Two (2) emergent/scrub-shrub and forested wetlands totaling 0.76 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM

Elevation of established OHWM (if known):

- 2. Non-regulated waters/wetlands (check if applicable):³
- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Big Sandy Watershed: 410.4 square miles. Drainage area:

Average annual rainfall: 50 inches Average annual snowfall: 21 inches

(ii) Physical Characteristics:

- (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.
 - Tributary flows through 1 tributary before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: Stream 4 (an intermittent RPW) flows into Blaine Creek (a perennial RPW), which flows into the Big Sandy River (a TNW).

Tributary stream order, if known: Second

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain: Culvert and access road over Stream 4 near Blaine Creek. Stream 4 begins from a wetland that was created from a dam outfall.

³ Flow route can be described by identifying, e.g., tributary n. which flows through the review area, to flow into tributary b, which then flows into TNW.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Tributary properties with respect to top of bank (estimate): Average width: I foot Average depth: 3 inches Average side slopes: 2:1 Primary tributary substrate composition (check all that apply): Silts Sands Concrete 1 Cobbles 17 Gravel Muck Г Bedrock Г Vegetation. Type/% cover: V Other. Explain: detritus Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated. Presence of run/riffle/pool complexes. Explain: No run/riffle/pool complexes. Tributary geometry: Relatively Straight Tributary gradient (approximate average slope): % (c) Flow: Tributary provides for: Seasonal Flow Estimate average number of flow events in review area/year: 20 (or greater) Describe flow regime: Intermittent Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inches of precipitation in Lawrence County, Kentucky, Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceed three months. Surface flow is: Discrete and Confined Characteristics: Subsurface flow: Unknown Explain findings: Dye (or other) test performed: Tributary has (check all that apply): P Bed and banks OHWM⁶ (check all indicators that apply): IF clear, natural line impressed on the bank [] the presence of litter and debris C changes in the character of soil 2 destruction of terrestrial vegetation [] the presence of wrack line **Shelving** vegetation matted down, bent, or absent sediment sorting Scour Ieaf litter disturbed or washed away F sediment deposition multiple observed or predicted flow events [] water staining [abrupt change in plant community □ other (list): Discontinuous OHWM.7 Explain: If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: Mean High Water Mark indicated by: Survey to available datum; oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings; physical markings/characteristics vegetation lines/changes in vegetation types. ☐ tidal gauges □ other (list): (iii) Chemical Characteristics: Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Acid Mine Drainage (AMD) appeared to be present (orange coloration in water). Identify specific pollutants, if known: AMD appeared to be present

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): >18 meters
 - Wetland fringe. Characteristics: Wetlands 14 and 17 abut Stream 4.
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW
 - (i) Physical Characteristics:
 - (a) General Wetland Characteristics:
 - Properties:
 - Wetland size: 0.76 acres

Wetland type. Explain: Emergent/Scrub-Shrub and Forested Wetland quality. Explain: Low to Medium, ORAM Category 1 and 2 Project wetlands cross or serve as state boundaries. Explain:

(b) <u>General Flow Relationship with Non-TNW</u>: Flow is: Intermittent Flow Explain:

> Surface flow is: Overland Sheetflow Characteristics:

Subsurface flow: Explain findings:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting
 - Not directly abutting
 - □ Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - □ Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are 1-2 river miles from TNW. Project waters are 1-2 aerial (straight) miles from TNW. Flow is from: Wetland to Navigable Waters Estimate approximate location of wetland as within the floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland appeared to be impacted by AMD.

Identify specific pollutants, if known: AMD appeared to be present

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): The wetlands provide buffers <30'.
- Vegetation type/percent cover. Explain: herbaceous 80-100%; scrub-shrub 20-30% and forested 80-100%.
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 2 Approximately (0.76) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W-14 Y	0.21		
W-17 Y	0.55		

Summarize overall biological, chemical and physical functions being performed: These wetlands perform numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. The wetlands have the capacity to transfer nutrients and organic carbon to support downstream food-webs. The wetlands have a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TI TNWs: linear feet width (ft), Or, acres.
 - Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inches of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceed three months.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: One (1) intermittent stream channel totaling 3,343 linear feet.
- Other non-wetland waters: acres. Identify type(s) of waters:

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- □ Tributary waters:
- Other non-wetland waters: acres. Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
 - [7] Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetlands 14 and 17 are physically proximate to Stream 04.

Provide acreage estimates for jurisdictional wetlands in the review area: Two (2) wetlands totaling 0.76 acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - □ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - F from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - ☐ Interstate isolated waters. Explain:
 - C Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- □ Tributary waters: linear feet width (ft).
- □ Other non-wetland waters: acres.

Identify type(s) of waters:

- Wetlands: acres.
- See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category. Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos

- NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
 - If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
 - Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- □ Lakes/ponds: acres.

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- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- □ Lakes/ponds: acres.
 □
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [7] Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg and Pritchard, KY 1:24,000 USGS Quadrangles.
 - □ State/Local wetland inventory map(s):
 - FEMA/FIRM maps: 21127C120D

- [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: [] Aerial (Name & Date):
 - or 🔽 Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007) Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channel and Abutting Wetlands (draining to Blaine Creek)

doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59. doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007) Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels. Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x

Cher information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013).

B. ADDITIONAL COMMENTS TO SUPPORT JD: Based on the aforementioned findings, the two (2) emergent/scrub shrub and forested wetlands, totaling 0.76 acres provide flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat adjacent to the one (1) identified unnamed intermittent (RPW) tributary (Stream 4). This intermittent tributary functions as a headwater stream channel providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

INTERMITTENT STREAMS AND WETLANDS DRAINING TO BLAINE CREEK WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID#	Description/Tributary Name	Latitude	Longitude	Size (linear feet - streams, or acres - wetlands)	HUC	Quad
Stream 04	Unnamed Intermittent (RPW) Tributary to Blaine Creek	38.179875	-82.625015	3,343	Big Sandy	Fallsburg and Pritchard
Wetland 14	PEM/PSS Wetland	38.179076	-82.625342	0.21	Big Sandy	Fallsburg
Wetland 17	PFO Wetland	38.185963	-82.625944	0.55	Big Sandy	Fallsburg
otal: 1 stre	am, 2 wetlands			Stream: 3,343 Wetlands: 0.76	Contract of Contract of	

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 9/16/14

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Lawrence County City: Louisa Center coordinates of site (lat/long in degree decimal format): Lat. 38.184825°, Long -82.643639°

Universal Transverse Mercator: Name of nearest waterbody: Blaine Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Big Sandy River Name of watershed or Hydrologic Unit Code (HUC): Big Sandy (05070204)

Name of watershed of Hydrologic Onit Code (HOC). Big Sandy (05070204)

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ✓ Office (Desk) Determination. Date: August 1, 2014
- Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 C.F.R. part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 C.F.R. part 328) in the review area. [Required] 1. Waters of the U.S.

- a. Indicate presence of waters of U.S. in review area (check all that apply): 1
- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: Twelve (12) intermittent stream channels totaling 8,377 linear feet. Wetlands: One (1) emergent/scrub-shrub wetland totaling 0.03 acres (Wetland 06). Ponds: One (1) pond totaling 0.24 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual and OHWM Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):3

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). ³ Supporting documentation is presented in Section III.F.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

-1-

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.A.1 and Section III.A.1 and Section III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

I. TNW

Identify TNW: Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

- 1. Characteristics of non-TNWs that flow directly or indirectly into TNW
 - General Area Conditions: Watershed size: Big Sandy Watershed: 410.4 square miles. Drainage area:

Average annual rainfall: 50 inches Average annual snowfall: 21 inches

- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>
 - Tributary flows directly into TNW.

Tributary flows through 3 tributaries before entering TNW.

Project waters are 2-5 river miles from TNW. Project waters are NA river miles from RPW. Project waters are 2-5 aerial (straight) miles from TNW. Project waters are NA aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: NA

Identify flow route to TNW⁵: Streams 11, 13, 15, 17, 18, 22, 35, 39, 41, 46, 70, and 71 all flow into the fly ash waste water treatment pond. The fly ash pond flows into Stream 30 (a perennial RPW), which flows into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW). Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: 🔽 Natural

- Artificial (man-made). Explain:
- Manipulated (man-altered). Explain:

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

³ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

Tributary p	properties	with respect	to top of	bank ((estimate):
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Average width: 2 feet

Average depth: 4 inches

Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

V	Silts	V	Sands	F	Concrete
V	Cobbles	V	Gravel	Г	Muck
Г	Bedrock	Г	Vegetation. Type/% cover:		

2 Other. Explain: boulder, clay

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Fairly stable, vegetated. Presence of run/riffle/pool complexes. Explain: Run/riffle/pool complexes observed in Streams 15 and 71. Tributary geometry: Relatively Straight

Tributary gradient (approximate average slope): 15%

(c) Flow:

Tributary provides for: Seasonal Flow

Estimate average number of flow events in review area/year: 20 (or greater)

Describe flow regime: Seasonal intermittent

Other information on duration and volume: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there is an average of approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area.

Surface flow is: Discrete and Confined Characteristics:

Subsurface flow: Unknown Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

- F | Bed and banks
- OHWM⁶ (check all indicators that apply):

Clear, natural line impressed on the bank	□ the presence of litter and debris
□ Changes in the character of soil	□ destruction of terrestrial vegetation
□ shelving	T the presence of wrack line
[] vegetation matted down, bent, or absent	□ sediment sorting
[] leaf litter disturbed or washed away	□ scour
Sediment deposition	F multiple observed or predicted flow events
water staining	□ abrupt change in plant community
□ other (list):	and the state of the state of the state of the
□ Discontinuous OHWM. ⁷ Explain:	
If factors other than the OHWM were used to determin	ne lateral extent of CWA jurisdiction (check all that apply):
□ F High Tide Line indicated by:	Mean High Water Mark indicated by:
□ oil or scum line along shore objects	 survey to available datum;
□ fine shell or debris deposits (foreshore)	physical markings;
□ physical markings/characteristics	vegetation lines/changes in vegetation types.

- T tidal gauges
- □ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water color in some streams appeared to be clear and were observed as turbid in other streams. Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. 7Ibid.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

- (iv) Biological Characteristics. Channel supports (check all that apply):
 - Riparian corridor. Characteristics (type, average width): Wooded >30'
 - Wetland fringe. Characteristics: Wetland 06 abuts Stream 22. Wetland 08 is located 25 feet to the southwest of Stream 46, Pond 01 abuts Stream 15.
 - Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provides terrestrial wildlife habitat.
- 2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics:
 - Properties: Wetland size: 0.03 acres Wetland type. Explain: Emergent/Scrub-Shrub Wetland quality. Explain: Medium, ORAM Category 2 (Wetland 06) Project wetlands cross or serve as state boundaries. Explain:
- (b) <u>General Flow Relationship with Non-TNW</u>: Flow is: Ephemeral Flow Explain:

Surface flow is: Overland Sheetflow Characteristics:

Subsurface flow: Explain findings:

- [] Dye (or other) test performed:
- (c) Wetland Adjacency Determination with Non-TNW:
 - I Directly abutting: Wetland 06 directly abuts Stream 22
 - Not directly abutting
 - Piscrete wetland hydrologic connection. Explain: Wetland 06 is located in close proximity to Stream 22.
 - Ecological connection. Explain: Wetland 06 is located in close proximity to Stream 22 and provides stormwater attenuation, filtering and wildlife habitat.
 - [] Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are 2-5 river miles from TNW. Project waters are 2-5 aerial (straight) miles from TNW. Flow is from: Wetland to Navigable Waters Estimate approximate location of wetland as within the 500-year or greater floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): Buffers >30'.
- Vegetation type/percent cover. Explain: herbaceous 75%, sapling/shrub: 25% (Wetland 06)
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - C Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Provide habitat for terrestrial wildlife.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 1

Approximately (0.03) acres in total are being considered in the cumulative analysis.

-4-

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)
W-06 Y	0.03

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed: Wetland 06 performs numerous functions such as flood storage, erosion and sediment control, pollution control through filtering and providing wildlife habitat. Wetland 06 has the capacity to transfer nutrients and organic carbon to support downstream food-webs, and it has a direct relationship on the physical, chemical and biological integrity of the Big Sandy River.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs, Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence
 or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- 1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, acres.
 - [] Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Based upon climate data accessed from Kentucky Mesonet (2011-2013), there are approximately 69 annual storm events exceeding 0.2 inch of precipitation in Lawrence County, Kentucky. Assuming that intermittent streams are flowing for 48 hours after each storm event, there are approximately 138 annual flow days for the intermittent streams in the study area. The estimated number of annual flow days exceeds three months.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: Twelve (12) intermittent stream channels totaling 8,377 linear feet.
- Other non-wetland waters: 0.24 acres. Identify type(s) of waters: Pond 1

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- □ Tributary waters:
- Other non-wetland waters: acres. Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

[7] Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetland 06 (0.03 acres) is physically proximate to Stream 22.

Provide acreage estimates for jurisdictional wetlands in the review area: One wetland (Wetland 06) totaling 0.03 acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area:

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area:

- 7. Impoundments of jurisdictional waters.9
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - □ which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - [Interstate isolated waters. Explain:
 - C Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

"See Footnote # 3.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Louisville District, LRL-2014-417-mdh, RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

- Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands:

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Other non-wetland waters: acres. List type of aquatic resource:.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - [77] Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: American Electric Power (applicant), URS Corporation (consultant) May 2013 submittal
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - [7] Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - □ Data sheets prepared by the Corps:
 - Corps navigable waters' study:
 - U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - IVICIAN STATE IN CONTRACT INCLUDINT CONTRACT IN CONTRACT IN CONTRACT IN CONTRACT IN CONTRACT INCLUCIENCIA IN CONTRACT INCLUCIA INCLUCIA INCLUCIA INCLUCIA INTENTI CONTRACTICA INCLUCIA INTENTI INCLUCIA INCLUCIA INTENTI CONTRACTICA INCLUCIA INTE
 - U.S. Geological Survey map(s). Cite scale & quad name: Fallsburg, KY 1:24,000 USGS Quadrangle.
 - USDA Natural Resources Conservation Service Soil Survey. Citation: Lawrence County, KY soil survey
 - [7] National wetlands inventory map(s). Cite name: Fallsburg, KY 1:24,000 USGS Quadrangle.

 - FEMA/FIRM maps: 21127C0120D

FI

- [] 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: | Aerial (Name & Date):

or [7] Other (Name & Date): Photos taken by URS Corporation during 2012 field inspections.

- Previous determination(s). File no. and date of response letter:
- P Applicable/supporting case law: U.S. v. Cundiff, 555 F.3d 200 (6th Cir. 2009).
- Applicable/supporting scientific literature:

National Research Council (1995). Wetlands: Characteristics and Boundaries, National Academy Press, Washington, D.C.

Mitsch, William J., and Gosselink, James G. (1993). Wetlands, Van Nosttrand Reinhold Company, New York, New York

Kusler, Jon, and Opheim, Teresa (1996). Our National Wetland Heritage, Environmental Law Institute, Washington, D.C.

Mary C. Freeman, Catherine M. Pringle, C Rhett Jackson (2007) Hydrologic connectivity and the contribution of stream headwaters to ecological integrity at regional scales. Journal of the American Water Resources Association 43 (1), 5-14. doi:10.1111/j.1752-1688.2007.00002.x

Richard B. Alexander, Elizabeth W. Boyer, Richard A. Smith, Gregory E. Schwarz, Richard B. Moore (2007) The role of headwater streams in downstream water quality. Journal of the American Water Resources Association 43 (1), 41-59.

Louisville District, LRL-2014-417-mdh. RPW Intermittent Stream Channels Open Water and Abutting Wetland (draining to fly ash pond)

doi:10.1111/j.1752-1688.2007.00005.x

Mark S. Wipfli, John S. Richardson, Robert J. Naiman (2007) Ecological linkages between headwaters and downstream ecosystems: transport of organic matter, invertebrates, and wood down headwater channels. Journal of the American Water Resources Association 43 (1), 72-85. doi:10.1111/j.1752-1688.2007.00007.x

- Judy L. Meyer, David L. Strayer, J. Bruce Wallace, Sue L. Eggert, Gene S. Helfman, Norman E. Leonard (2007) The contribution of headwater stream to biodiversity in river networks Journal of the American Water Resources Association 43 (1), 86-103. doi:10.1111/j.1752-1688.2007.00008.x
- Other information (please specify): Climate data accessed from Kentucky Mesonet (2011-2013)

B. ADDITIONAL COMMENTS TO SUPPORT JD: Based on the aforementioned findings, the one (1) wetland (Wetland 06), totaling 0.03 acres provides flood storage, erosion and sediment control, pollution control through filtering and wildlife habitat and is proximate to one (1) unnamed intermittent (RPW) stream (Stream 22) that flows into the fly ash waste water treatment pond. The remaining eleven (11) intermittent streams and Pond 1 also flow into the fly ash waste water treatment pond (which is not considered a "water of the U.S." per 33 C.F.R. § 328.3(a)(8). The fly ash pond discharges into Stream 30 (a perennial RPW), which discharges into Blaine Creek (a perennial RPW). Blaine Creek flows into the Big Sandy River (a TNW). These intermittent tributaries function as a headwater stream channels providing water, nitrogen and organic matter transport functions as well as providing vertebrate habitat for deer, birds, and other small wildlife in the area. These functions have a substantial effect on the Big Sandy River (TNW) and thus establish a significant nexus to this TNW. *See supporting scientific literature under Section IV, A.

INTERMITTENT STREAMS, WETLANDS, AND PONDS DRAINING TO FLY ASH WASTEWATER TREATMENT POND WITHIN THE BIG SANDY POND CLOSURE PROJECT

ID#	Description/Tributary Name	Latitude	Longitude	Size	HUC	Quad
Stream 11	Tributary to fly ash pond	38.184825	-82.643639	491	Big Sandy	Fallsburg
Stream 13	Tributary to fly ash pond	38.185593	-82.648905	816	Big Sandy	Fallsburg
Stream 15	Tributary to fly ash pond	38.17573	-82.642819	895	Big Sandy	Fallsburg
Stream 17	Tributary to fly ash pond	38.179089	-82.645326	797	Big Sandy	Fallsburg
Stream 18	Tributary to fly ash pond	38.18225	-82.648104	1,120	Big Sandy	Fallsburg
Stream 22	Tributary to fly ash pond	38.183653	-82.63824	186	Big Sandy	Fallsburg
Stream 35	Tributary to fly ash pond	38.185591	-82.646285	561	Big Sandy	Fallsburg
Stream 39	Tributary to fly ash pond	38.181365	-82.645372	169	Big Sandy	Fallsburg
Stream 41	Tributary to fly ash pond	38.181378	-82.645992	652	Big Sandy	Fallsburg
Stream 46	Tributary to fly ash pond	38.18363	-82.638883	432	Big Sandy	Fallsburg
Stream 70	Tributary to fly ash pond	38.183888	-82.650984	442	Big Sandy	Fallsburg
Stream 71	Tributary to fly ash pond	38.185572	-82.653279	1,816	Big Sandy	Fallsburg
Wetland 06	PEM/PSS Wetland	38.185745	-82.637086	0.03	Big Sandy	Fallsburg
Pond 01	Pond	38.177116	-82.641885	0.24	Big Sandy	Fallsburg
Total: 12 s	treams, 1 wetland, 1 pond			Stream: 8,377 line Wetland: 0.03 acr Pond: 0.24 acre		

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

	REQUEST FOR APPEAL	
_	cant: American Electirc Power File Number: LRL-2014-417-mdh	Date: 9/18/2014
Attac	hed is:	See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
1	PROFFERED PERMIT (Standard Permit or Letter of permission)	В
	PERMIT DENIAL	C
Х	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E
decis http:/	FION I - The following identifies your rights and options regarding an administrative ion. Additional information may be found at //www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 C NITIAL PROFFERED PERMIT: You may accept or object to the permit.	
• A au si	CCEPT: If you received a Standard Permit, you may sign the permit document and return it to the dis uthorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is gnature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entire appeal the permit, including its terms and conditions, and approved jurisdictional determinations asso	authorized. Your ety, and waive all rights
th Y tc m th	BJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein the permit be modified accordingly. You must complete Section II of this form and return the form to the our objections must be received by the district engineer within 60 days of the date of this notice, or you o appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your ob- toodify the permit to address all of your concerns, (b) modify the permit to address some of your object the permit having determined that the permit should be issued as previously written. After evaluating yes istrict engineer will send you a proffered permit for your reconsideration, as indicated in Section B bel	e district engineer. u will forfeit your right ojections and may: (a) ions, or (c) not modify our objections, the
B: P	ROFFERED PERMIT: You may accept or appeal the permit	10.000
ai	CCEPT: If you received a Standard Permit, you may sign the permit document and return it to the dis uthorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is gnature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entire appeal the permit, including its terms and conditions, and approved jurisdictional determinations asso	authorized. Your ety, and waive all rights
m fc	PPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and any appeal the declined permit under the Corps of Engineers Administrative Appeal Process by complete orm and sending the form to the division engineer. This form must be received by the division engineer ate of this notice.	ting Section II of this
by con	ERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Adminis mpleting Section II of this form and sending the form to the division engineer. This form must be rece eer within 60 days of the date of this notice.	
	PPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the ide new information.	e approved JD or
	CCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps v ate of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal	
A	PPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of E ppeal Process by completing Section II of this form and sending the form to the division engineer. The the division engineer within 60 days of the date of this notice.	
regar appro	RELIMINARY JURISDICTIONAL DETERMINATION: You do not need to responding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may be appealed), by contacting the Corps district for further instruction de new information for further consideration by the Corps to reevaluate the JD.	y request an

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an
initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons
or objections are addressed in the administrative record.)

x

ADDITIONAL INFORMATION: The appeal is limited to a revie record of the appeal conference or meeting, and any supplemental clarify the administrative record. Neither the appellant nor the Co you may provide additional information to clarify the location of it	information that the review office orps may add new information or a	r has determined is needed to nalyses to the record. However,
POINT OF CONTACT FOR QUESTIONS OR INFOR	RMATION:	
If you have questions regarding this decision and/or the appeal process you may contact: Mr. Michael Hasty, Senior Project Manager US Army Engineer District Louisville Attn: CELRL-OP-FS PO Box 59 Louisville, KY 40201-0059 TEL (502) 315-6676; FAX (502) 315-6677 michael.d.hasty@usace.army.mil	also contact: US Army Corps of ATTN: Appeal Rev 550 Main Street RJ Cincinnati, OH 452 TEL (513) 684-621	view Officer CELRD-PD-REG M 10524 202-3222 2; FAX (513) 684-2460
RIGHT OF ENTRY: Your signature below grants the right of ent consultants, to conduct investigations of the project site during the notice of any site investigation, and will have the opportunity to p	e course of the appeal process. Yo	u will be provided a 15 day
Signature of appellant or agent.	Date:	Telephone number:



United States Department of the Interior

FISH AND WILDLIFE SERVICE Kentucky Ecological Services Field Office 330 West Broadway, Suite 265 Frankfort, Kentucky 40601 (502) 695-0468

May 16, 2012

Ms. Rebekah Hovermale Environmental Specialist II Water and Ecological Resource Services American Electric Power 1 Riverside Plaza Columbus, Ohio 43215

Re: FWS 2012-B-0544; American Electric Power, Big Sandy Plant Landfill Project, located in Lawrence County, Kentucky

Dear Ms. Hovermale:

The U.S. Fish and Wildlife Service (Service) has reviewed your correspondence of April 27, 2012 regarding the above-referenced project. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the Indiana bat (*Myotis sodalis*) is the only federally listed species that has the potential to occur within the project vicinity.

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

Summer roost habitat for the endangered Indiana bat may exist within the proposed project site. Based on this information, we believe that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula (*i.e.* cave), where they feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and may last from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendation relative to Indiana bats.

• We recommend that the project proponent only remove trees within the project area between October 15 and March 31 in order to avoid impacting summer roosting Indiana bats.

However, if this recommendation cannot be incorporated as a project condition, then the project area may be surveyed to determine the presence or absence of this species within the project area in an effort to determine if potential impacts to the Indiana bat are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

If your project schedule requires the clearing of potential Indiana bat habitat (*i.e.*, trees that are greater than 5 inches DBH and exhibit any of the following characteristics: exfoliating bark, cracks, crevices, dead portions, cavities, broken limbs) during the period of April 1 to October 14, you have two primary options for addressing impacts to Indiana bats. First, you can survey the project site as described previously, or you can enter into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into a Conservation MOA with the Service, Cooperators gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation

benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact James Gruhala at (502) 695-0468 extension 116.

Sincerely,

Vigil Lee Andrews, Jr.

Field Supervisor

Steven L. Beshear Governor



Leonard K. Peters Secretary Energy and Environment Cabinet

> Donald S. Dott, Jr. Director

Commonwealth of Kentucky Kentucky State Nature Preserves Commission 801 Schenkel Lane Frankfort, Kentucky 40601-1403 502-573-2886 Voice 502-573-2355 Fax

May 23, 2012

Matthew Thomayer URS Corporation 36 East Seventh St., Ste 2300 Cincinnati, OH 45202

Data Request 12-107

Dear Mr. Thomayer:

This letter is in response to your data request of May 16, 2012 for the AEP Big Sandy Plant Landfill project (Lawrence County) project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur near the project area on the Fallsburg and Pritchard USGS Quadrangle, as shown on the map provided. Please see the attached reports for more information, which reflect analysis of the project area with three buffers applied:

1-mile for all records – 2 records
5-mile for aquatic records – 3 records
5-mile for federally listed species – 1 record
10-mile for mammals and birds – 1 record

None of our records were found within 1/2 mile of the project boundary.

Haliaeetus leucocephalus (Bald eagle, federally delisted, KSNPC threatened) is known to occur within ten miles of the proposed project. This species can be found near seacoasts, rivers and large lakes. Preferentially roosts in conifers in winter in some areas. In winter, may associate with waterfowl concentrations or congregate in areas with abundant dead fish.

Several monitored and even federally listed aquatic species have been previously reported from Blaine Creek and the Big Sandy River in the area of the project. Even though these are possibly extirpated from the area, aquatic species and habitats are sensitive to increased turbidity, sediment, and other adverse influences on water quality and should be protected from further



Data Request 12-107 May 23, 2012 Page 2

degradation. Our data are not sufficient to guarantee absence of endangered, threatened or sensitive species from the sites of proposed disturbance. We recommend that impacted streams be thoroughly surveyed by a qualified biologist prior to any in-stream disturbance.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.



Data Request 12-107 May 23, 2012 Page 3

If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines Data Manager

SLD/SGH

Enclosures: Data Report and Interpretation Key



Donald S. Dott, Jr. Director



Steven L. Beshear Governor

Commonwealth of Kentucky Kentucky State Nature Preserves Commission 801 Schenkel Lane Frankfort, Kentucky 40601-1403 502-573-2886 Voice 502-573-2355 Fax

INVOICE

May 23 2012

Matthew Thomayer URS Corporation 36 East Seventh St., Ste 2300 Cincinnati, OH 45202

Purchase Order Number _____

Data Request 12-107

This letter is an invoice for the amount of <u>84.38</u> for data services requested in your letter of May 16, 2012 for AEP Big Sandy Plant Landfill project (Lawrence County) project.

Please make payment to the Kentucky Nature Preserves Fund and include the Data Request number on your check. Payment is due upon receipt.

Please contact us if we can be of further assistance.



AUG 2 2 2014



STEVEN L. BESHEAR GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET KENTUCKY HERITAGE COUNCIL

THE STATE HISTORIC PRESERVATION OFFICE 300 WASHINGTON STREET FRANKFORT, KENTUCKY 40601 PHONE (502) 564-7005 FAX (502) 564-5820 www.heritage.ky.gov BOB STEWART SECRETARY

CRAIG A. POTTS EXECUTIVE DIRECTOR AND STATE HISTORIC PRESERVATION OFFICER

August 14, 2014

Ms. Jill N. Lukehart Water and Ecological Resource Services American Electric Power 1 Riverside Plaza Columbus, OH 43215-2373

Re: Phase I Archaeological Survey of American Electric Power's Big Sandy Plant Pond Closure Project in Lawrence County, Kentucky by Crista M. Haag of URS

Dear Ms. Lukehart:

Thank you for the above referenced report. This project entailed pedestrian survey and shovel testing of the project area. No new historic or prehistoric archaeological sites were recorded as a result of this survey, and the author recommends no further investigations of the project area. I concur with the author's findings and recommendations. We have no further comments and your responsibility to consult with the Kentucky State Historic Preservation Officer under the Section 106 review process for this project is fulfilled.

If the project design or boundaries change, this office should be consulted to determine the nature and extent of additional documentation that may be needed. In the event of the unanticipated discovery of an archaeological site or object of antiquity, the discovery should be reported to the Kentucky Heritage Council and to the Kentucky Office of State Archaeology in the Anthropology Department at the University of Kentucky in accordance with KRS 164.730. In the event that human remains are encountered during project activities, all work should be immediately stopped in the area and the area cordoned off, and in accordance with KRS 72.020 the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to the Kentucky Heritage Council.

Should you have any questions, feel free to contact Yvonne Sherrick of my staff at 502.564.7005, extension 113.

Sincerely,

Craig A. Potts, Executive Director and State Historic Preservation Officer

CP: KHC # 42219-3 Cc: George Crothers (OSA)



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United States Department of the Interior

FISH AND WILDLIFE SERVICE Kentucky Ecological Services Field Office 330 West Broadway, Suite 265 Frankfort, Kentucky 4060! (502) 695-0468 December 12, 2014

Mr. Atan. Wood, P.E.

Director, Water & Ecological Resource Services American Electric Power, Environmental Services 1 Riverside Plaza Columbus, Ohio 43215-2373

Re: FWS 2012-B-0544; American Electric Power, Big Sandy Plant, Fly Ash Pond Closure Project, located in Lawrence County, Kentucky

Dear Mr. Wood:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed your November 14, 2014 correspondence regarding the proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity. The listed species are:

Group	Species	Common name	Legal* Status
Mammals	Myotis sodalis	Indiana bat	E
Inalitiate	Myotis septentrionalis	Northern long-eared bat	P

* Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat

DEC 2 4 2014

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The proposed project is located in Indiana bat "potential habitat," therefore we believe that: (1) caves, rockshelters, and abandoned underground mines in the vicinity of and in the project area may potentially provide suitable wintering habitat for the Indiana bat; and (2) forested areas in the vicinity of and in the project area may potentially provide suitable summer roosting and foraging habitat for the Indiana bat. In order to address the concerns and be in compliance with the ESA, we have the following comments and recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

Indiana bat winter (hibernacula) habitat

According to your correspondence, a field site assessment report confirmed that the proposed project area lacks potential Indiana bat hibernacula habitat (*i.e.*; caves, abandoned mines, sink holes). Based on this information, the Service believes that the proposed project would have no effect to the Indiana bat hibernacula habitat.

Indiana bat summer roost / foraging habitat

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH. According to your correspondence, the proposed project would result in the removal of some potential Indiana bat summer roost / foraging habitat.

Your request indicates that the project proponent will commit to conducting all projectassociated tree removal during "unoccupied" time. The Service believes that conducting all project-associated tree removal between the dates of October 15th and March 31st would likely avoid direct effects to Indiana bats. Even though removing trees during the specified "unoccupied" period likely avoids direct effects, the proposed project may still have significant indirect and cumulative effects to Indiana bats. To address our concerns relative to the potential indirect and cumulative effects to Indiana bats, we offer the following primary options to ensure that the project is in full compliance with the ESA.

- The project proponent can modify the proposed project to eliminate or reduce impacts to suitable Indiana bat habitat, thus avoiding impacts.
- The project proponent can survey the project site to determine the presence or absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must

undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

- The project proponent can assume presence of the Indiana bat in the proposed project area and mitigate for the impacts of habitat removal on the species by entering into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into an MOA, the Cooperator can gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat and/or avoid the need for surveys or additional analysis. In exchange, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.
- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is sufficient supporting information to concur with the determination.

Northern long-eared bat

The proposed project area is within potential northern long-eared bat summer roost/foraging habitat. The northern long-eared bat is currently proposed for federal listing under the ESA. The entire Commonwealth of Kentucky is considered potential habitat for the northern long-eared bat. During the summer, Northern long-eared bats typically roost singly or in colonies in a wide-variety of forested habitats, where they seek shelter during daylight hours underneath bark or in cavities/crevices of both live trees and snags, including relatively small trees and snags that are less than 5 inches in DBH. Northern long-eared bats have also been documented roosting in man-made structures (i.e., buildings, barns, etc.) during the summer. According to current winter occurrence data, northern long-eared bats predominately winter in hibernacula that include caves, tunnels, and underground mine passages.

Federal action agency(s) for the proposed project are encouraged to voluntarily confer with the Service on any federal action which is likely to jeopardize the continued existence of the northern long-eared bat (ESA, Section 7(a)(4). The conference process is discretionary if the proposed action may affect a proposed species, like the northern long-eared bat. At this time, no designated critical habitat has been proposed for the northern long-eared bat. Although species proposed for listing are not afforded protection under the ESA, when a species is listed, the ESA prohibition under Section 7(a)(2) becomes effective 30 days after the publication of the final rule, regardless of an action's stage of completion.

According to your correspondence, the proposed project would result in the removal of some potential northern long-eared bat summer roost / foraging habitat and the project-associated tree removal is expected to occur during 2015. The final rule to list the northern long bat or not is expected to be published by April 2, 2015. If the project-associated construction activities

continue after April, 2015, and the northern long eared bat is listed as threatened or endangered, the federal action agency is required to consult with the Service if it is determined that the proposed project may affect the northern long-eared bat. The Service may recommend additional minimization and mitigation measures to ensure that the proposed project is in full compliance with the ESA relative to the northern long-eared bat. Therefore, to avoid significant project delays, we recommend that you contact our office to identify and resolve potential conflicts regarding the northern long-eared bat in your project area.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jim Gruhala of my staff at (502) 695-0468 extension 116.

Sincerely,

Virgil Lee Andrews, Jr.

Field Supervisor



American Electric Power 1 Riverside Plaza Columbus, OH 43215-2373 AEP.com

United States Fish and Wildlife Service Kentucky Ecological Services Field Station ATTN: Mr. Jim Gruhala 330 West Broadway, Suite 265 Frankfort, Kentucky 40601

February 11, 2015

Subject: Kentucky Power Company dba American Electric Power - Big Sandy Plant FWS 2012-B-0544 Fly Ash Pond Closure Project Pre-Development Consultation

Mr. Gruhala,

In 2012 and 2014, Kentucky Power Company dba American Electric Power (AEP) submitted correspondence to the U.S. Fish and Wildlife Service (USFWS), Kentucky Ecological Services Field Station describing the proposed closure of the facility's existing fly ash pond. A response letter dated December 12, 2014, was received and identified the federally-listed Indiana bat (*Myotis sodalis*) and the proposed-listed northern long-eared bat (*Myotis septentrionalis*) are the only species that have the potential to occur within the vicinity of the project. USFWS agreed that AEP's proposal of conducting tree clearing within the seasonal timeframe of October 15th-March 31st will likely avoid direct effects to the Indiana bat. However, the USFWS stated the project may have significant indirect and cumulative effects and provided four options that may be implemented to ensure compliance. A copy of the correspondence between AEP and USFWS in 2014 is attached.

Since the beginning of the Project, AEP has sought to avoid and minimize impacts to forested habitat to the extent possible. However, due to the nature of the Project, tree clearing in certain areas cannot be avoided. Where impacts are unavoidable, AEP considered design alternatives that reduced impacts to the extent possible. This avoidance and minimization is depicted with the successively smaller boundaries of planned limits of disturbance that were conceptually designed in April 2013, July 2014, and December 2014, respectively, as depicted on Figure 2 (attached).

Because the nature of the project requires unavoidable clearing of forested habitat, to address the concerns regarding indirect and cumulative effects to the Indiana bat, AEP will assume presence within the project area and mitigate potential impacts of habitat removal by entering into a Conservation Memorandum of Agreement (CMOA) with the USFWS. This approach is also expected to satisfy any necessary indirect or cumulative effects to the northern long-eared bat, should it be listed in the future.

Jim Gruhala February 11, 2015 Page 2

The "polygon method" was used to estimate the total area of clearing impact for the project. Accordingly, the total acreage is approximately 101.1-acres (refer to attached Figure 3). Further, AEP will commit to conducting all project-associated tree removal within the October 15th-March 31st timeframe. As a result, AEP will contribute \$159,232.50 to the Indiana Bat Conservation Fund (IBCF) based on a mitigation ratio of 0.5 and the current rate of \$3,150/acre. Should the USFWS find this proposal acceptable, AEP requests approval for the proposed tree clearing activities associated with this project.

If you have any questions regarding this information, please contact Jill N. Lukehart of my staff at (614) 716-2209 or at jnlukehart@aep.com

Alan R. Wood, P.E. Director, Water and Ecological Resource Services AEP Environmental Services

Attachments:

2014 AEP and USFWS Correspondence Figure 1: Overview Figure Figure 2: Limit of Disturbance Comparison Map Figure 3: Forested Habitat Clearing Map



CULTURAL RESOURCES WALKOVER OF AMERICAN ELECTRIC POWER COMPANY, INC.'S BIG SANDY PLANT POND CLOSURE PROJECT IN LAWRENCE COUNTY, KENTUCKY

Lead Agency: United States Army Corps of Engineers, Louisville District

Contains Privileged Information – Do Not Release

Prepared for: American Electric Power Company, Inc.

November 2012

525 Vine Street, Suite 1800 Cincinnati, Ohio 45202 Voice (513) 651-3440 Fax (513) 651-3452

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PRINCIPAL INVESTIGATOR:

Christopher Bergman, PhD, RPA

ABSTRACT

URS Corporation (URS) was contracted by American Electric Power Company, Incorporated (AEP) to conduct a cultural resources walkover for the proposed Big Sandy Plant Pond Closure Project near Louisa in Lawrence County, Kentucky (the Project). The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed). The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE).

The Area of Potential Effect (APE) will include all areas where ground disturbance associated with the Project will occur. In this instance, the APE consists of approximately 573 acres (232 hectares) contained within the maximum limits of disturbance for the Project. URS recognizes that a smaller area may be impacted within this APE. Because the lead agency for the Project is the USACE, special attention was given to the USACE jurisdictional areas, which consisted of streams, wetlands, vernal pools, and ponds.

Given the results of the background research, which recorded a low number of cultural resources within two kilometers (1.2 miles) of the Project; the large degree of previous disturbance and deflation exhibited within the soils during the walkover; and the incidence of steep slope greater than 15 percent; the APE displays a low probability for containing intact archaeological resources.

As a result, a majority of the APE would not require formal Phase I archaeological survey. In areas with steep slope near USACE jurisdictional areas, a pedestrian survey meeting the KHC guidelines may be conducted to identify any caves, quarries, benches, rock faces, and rock overhangs. If identified, these resources would need to be surveyed per the methodology in Sanders (2006:22). The only level area that would need formal Phase I archaeological survey may be the ridgeline in the eastern portion of the APE near the USACE jurisdictional area. The family cemetery that was identified within the western half of the APE should be avoided.

With regard to the indirect (viewshed) APE, because the Project involves the closure of an existing facility there appears to be no major viewshed concerns. No architectural history survey is therefore recommended. If the scope of the Project changes, the viewshed may need to be re-evaluated for indirect effects.

TABLE OF CONTENTS

SECTION PAGE ABSTRACT.....i 1.0 INTRODUCTION AND PROJECT DESCRIPTION......1 PROJECT DESCRIPTION AND PROJECT AREA OF POTENTIAL 1.1 2.0 3.0 3.1 3.2 OCTOBER 2012 FIELD RESULTS......11 3.3 4.05.0

TABLES

Table 2.1.	Previous Archaeological Sites within the Archival Study Area	.3
Table 3.1.	Summary of SL Data in Western Portion of APE	.8
Table 3.2.	Summary of SL Data in Eastern Portion of APE	14

FIGURES

Figure 1.1.	Project Overview on a Topographic Map	2
Figure 3.1.	Cultural Resources Walkover Results on a Topographic Map	5
Figure 3.2.	Cultural Resources Walkover Results on an Aerial Photograph	6
Figure 3.3.	Areas of Slope within the APE with greater than 15 Percent Slope	.12
Figure 4.1.	Soils within the APE	.18

PLATES

Plate 3.1.	Example of Existing Fly Ash Pond	.7
Plate 3.2.	Example of Wooded Slopes.	.7
Plate 3.3.	Example of Existing Access Road.	.8
Plate 3.4.	Example of Deflated Soils	.9
Plate 3.5.	Example of Disturbed Soils.	.9
Plate 3.6.	Overview of Cemetery	10

AEP Big Sandy	
Cultural Resources Walkover	

Plate 3.7. Example of Oldest Grave at Cemetery	10
Plate 3.8. Example of a Rock Overhang	11
Plate 3.9. Overview of the Eastern Portion of the APE	13
Plate 3.10. Overview of the Dam within the APE (photo taken north of the dam)	13
Plate 3.11. Overview of the APE just north of the Dam.	14
Plate 3.12. Overview of the APE within the level ridgeline	15

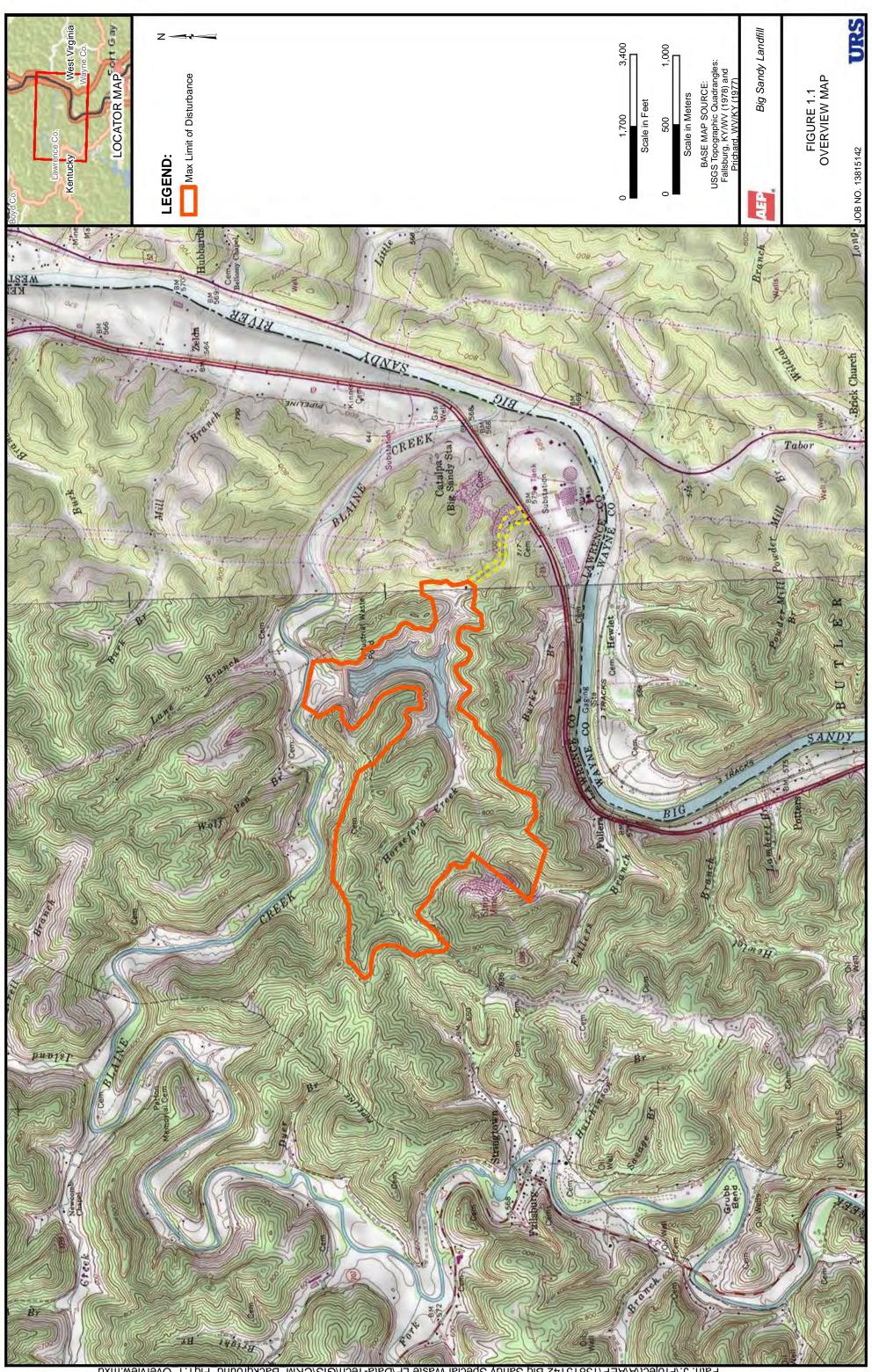
1.0 INTRODUCTION AND PROJECT DESCRIPTION

URS Corporation (URS) was contracted by American Electric Power Company, Incorporated (AEP) to conduct a cultural resources walkover for the proposed Big Sandy Plant Pond Closure project in Lawrence County, Kentucky (the Project). The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed).

1.1 PROJECT DESCRIPTION AND PROJECT AREA OF POTENTIAL EFFECT

AEP's Kentucky Power Company owns and operates the 1,097 Mega Watt (MW) Big Sandy Plant on the west bank of the Big Sandy River, near Louisa in Lawrence County, Currently, coal combustion fly ash from the plant is disposed of in the Big Sandy Fly Ash reservoir, which is impounded by the Horseford Creek Dam located approximately 0.75 miles northwest of the plant. In expectation of future Federal Regulations pertaining to wet ash impoundments, the Project involves closure design of the Plant's existing 130acre (53-hectare) wet fly ash impoundment, which will no longer be needed for wet sluice disposal beginning in 2016 (Figure 1.1). In an effort to effectively close the fly ash reservoir in accordance with expected but not-yet-promulgated Federal Regulations for wet CCP impoundments, it is AEP's desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond. The lead federal agency for the Project is the United States Army Corps of Engineers, Louisville District (USACE).

The Area of Potential Effect (APE) will include all areas where ground disturbance associated with the Project will occur. In this instance, the APE consists of approximately 573 acres (232 hectares) contained within the maximum limits of disturbance for the Project. Because the lead agency for the Project is the USACE, special attention was given to the USACE jurisdictional areas, which consisted of streams, wetlands, vernal pools, and ponds.



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2.0 BACKGROUND RESEARCH

URS conducted background research in March 2012 utilizing the electronic GIS shapefiles from the Office of the State Archaeologist (OSA) in Lexington, and the Kentucky Heritage Council (KHC) in Frankfort, to locate any previously recorded cultural resources within a two-kilometer (1.2-mile) radius of the APE (referred to as the Archival Study Area, for ease of reference). This research was conducted with the primary goal of identifying any cultural resources that were previously defined within or adjacent to the APE for the Project.

As a result of the background research, only eight archaeological sites were identified within the Archival Study Area, none of which occur within the APE. One cemetery was also documented within the APE after an examination of topographic mapping.

Table 2.1 lists the archaeological sites documented within the Archival Study Area. Of these eight archaeological sites, all are located on the floodplain or on a terrace of Blaine Creek to the north of the Project. All of these resources are documented as unassigned prehistoric locales.

Site Number	Temporal Period	Site Type	NRHP Status	
15La80	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La81	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La82	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La83	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La84	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La85	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La86	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La87	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	
15La88	Unassigned Prehistoric	Open habitation w/o mounds	Not Recorded	

Table 2.1. Previous Archaeological Sites within the Archival Study Area

3.0 WALKOVER FIELD METHODS AND RESULTS

3.1 FIELD METHODS

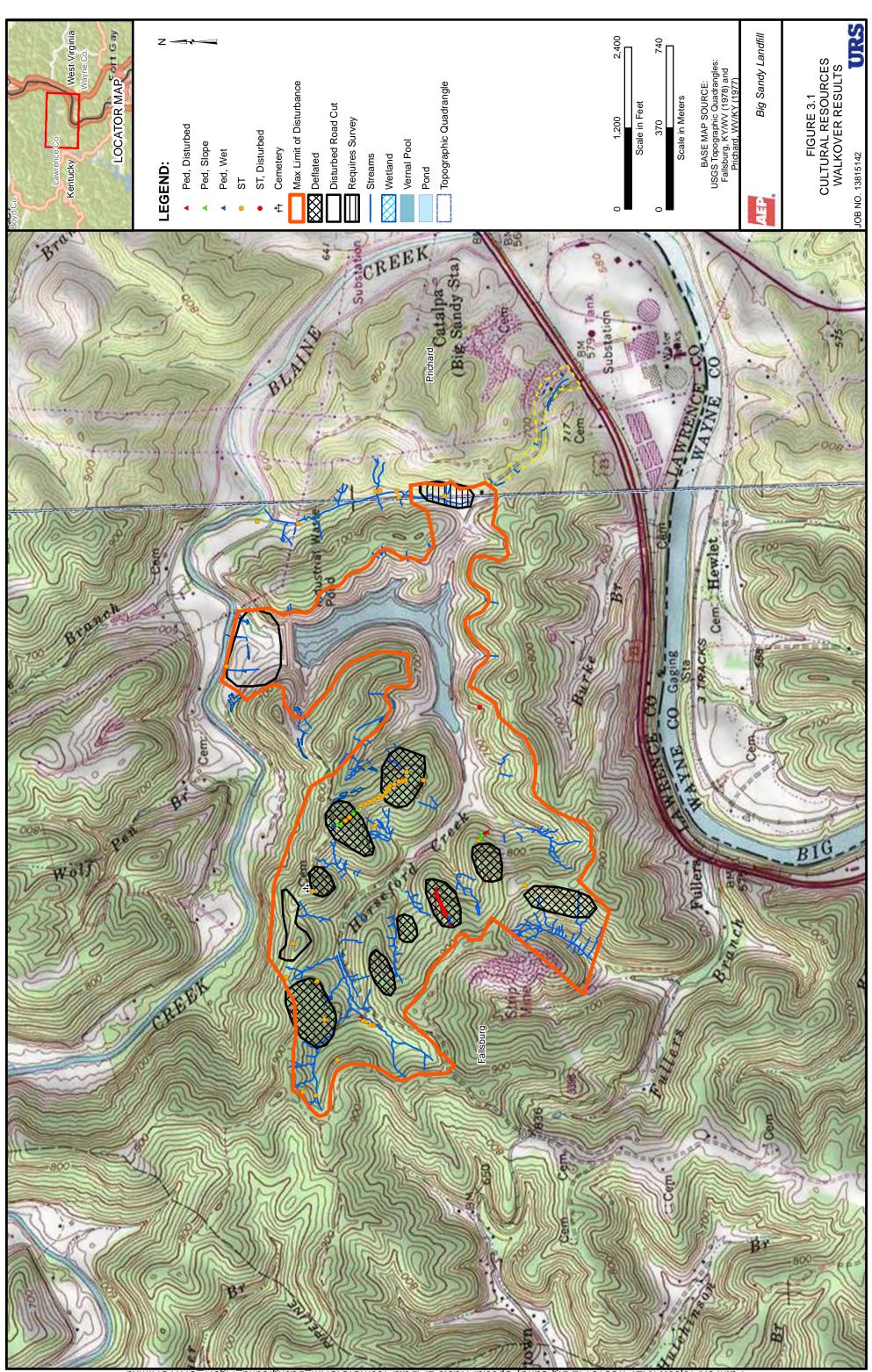
URS conducted a cultural resources walkover of the APE in March 2012 and October 2012. The March 2012 visit focused on the western portion of the APE, while the October 2012 visit focused on the eastern portion of the APE.

The cultural resources walkover involved photo documentation of the APE, including general views of the surrounding landscape, in addition to visible above-ground cultural features, obvious disturbance, steep slope, etc. In addition to photography, URS, when possible, excavated shovel probes to verify the presence of intact soils and/or disturbance.

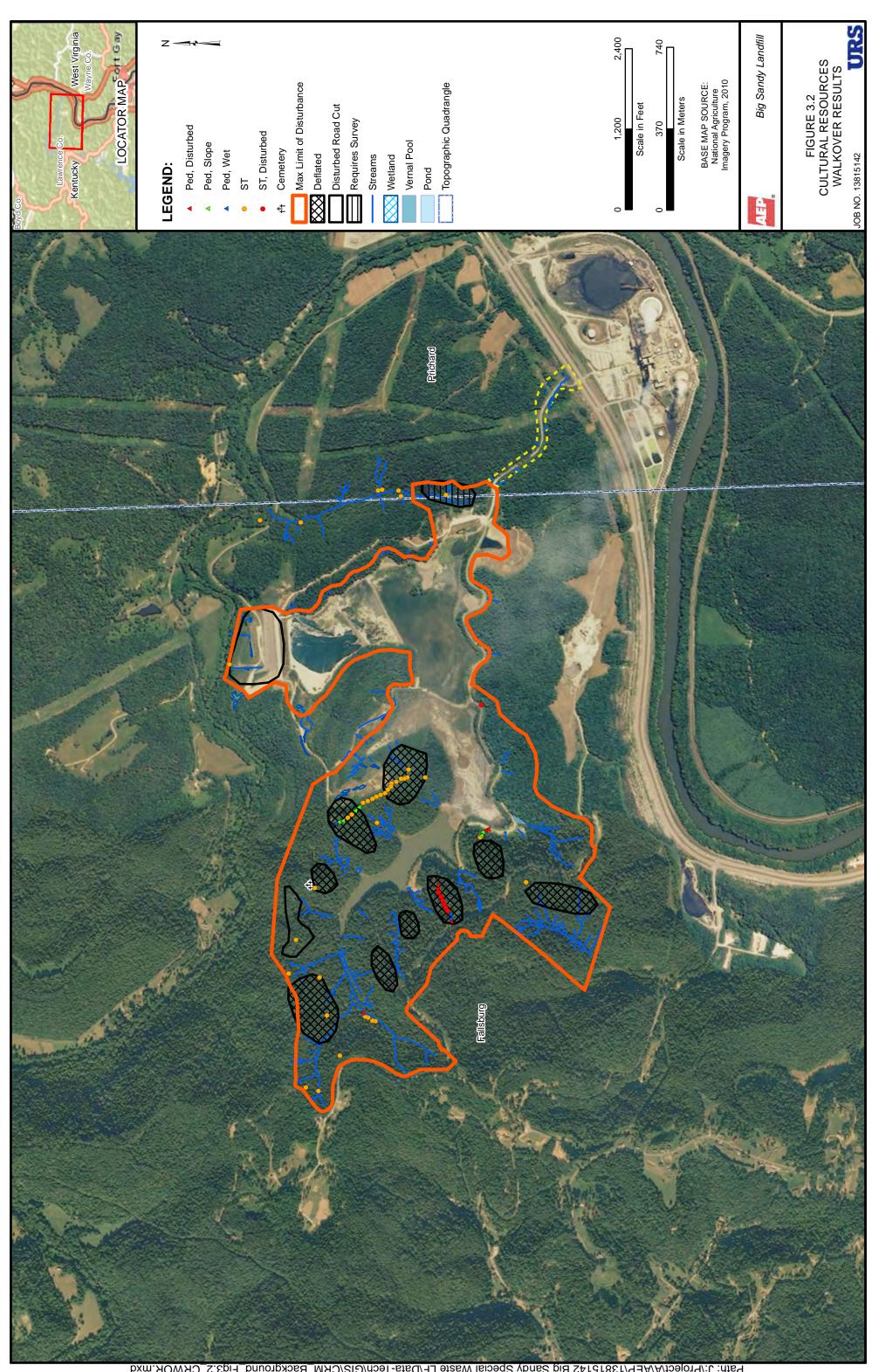
Shovel probes were excavated in accordance with the KHC guidelines entitled, *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Sanders 2006). A 20-meter interval was utilized, and minimally 30 centimeter in diameter holes were excavated to archaeologically sterile soil or to 50 centimeters below the surface. Excavated soils were screened through ¹/₄ inch wire mesh and examined for evidence of cultural materials. Profiles were described for each shovel probe and notes were recorded concerning the soil stratigraphy (including Munsell color designations and texture) and any cultural resources encountered. All shovel probes were assigned a unique designation that was then mapped with sub-meter accurate GPS equipment. During fieldwork, Sample Loci (SL) forms were completed by URS personnel.

3.2 MARCH 2012 FIELD RESULTS

The walkover for the western portion of the APE was conducted on March 22 and 23, 2012, by URS staff archaeologist Benjamin S. Goodwin, MA, RPA. This area was also revisited by Mr. Goodwin in October 2012. Within the APE there is an existing fly ash pond surrounded by steep wooded slopes with some level areas on the outer portions of the APE (Plates 3.1 and 3.2). An existing access road extends around the entire fly ash facility that corresponds roughly to the APE boundary (Plate 3.3). A total of 42 SL were examined during the walkover of this western portion of the APE, 27 of which were excavated as shovel probes, and these are summarized in Table 3.1 (see Figures 3.1 and 3.2 for walkover results).



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Plate 3.1. Example of Existing Fly Ash Pond.



Plate 3.2. Example of Wooded Slopes.



Plate 3.3. Example of Existing Access Road.

SL Type	SL Count (n=)		
Pedestrian, Disturbed	6		
Pedestrian, Slope	6		
Pedestrian, Wet	3		
Shovel Probe, Disturbed	7		
Shovel Probe, Negative	20		
Total	42		

 Table 3.1.
 Summary of SL Data in Western Portion of APE

Large portions of the level areas surrounding the existing ash pond are either deflated or disturbed (Plates 3.4 and 3.5). Deflated soil profiles, such as SL 7, revealed a brown (10YR 4/3) silt loam to a depth of 15 centimeters below ground surface, with an underlying very pale brown (10YR 7/4) clay mottled with brownish yellow (10YR 6/6) clay B horizon soil. No cultural materials were recovered from the 27 excavated shovel probes.



Plate 3.4. Example of Deflated Soils.



Plate 3.5. Example of Disturbed Soils.

One family cemetery was documented within the western portion of the APE (see Figure 3.1 and 3.2). This cemetery appears to be maintained, and consists of 21 marked graves

dating from 1918 to 2010 (Plates 3.6 and 3.7). Family names in the cemetery include Elkins, Jones, McDaniel, Samson, and Thompson.



Plate 3.6. Overview of Cemetery.



Plate 3.7. Oldest Grave Identified at Cemetery.

Figure 3.3 illustrates areas within the APE that contain slope greater than 15 percent (encompassing most of the APE), and do not require formal Phase I cultural resources survey according to KHC guidelines (Sanders 2006). Sanders (2006:22) does suggest,

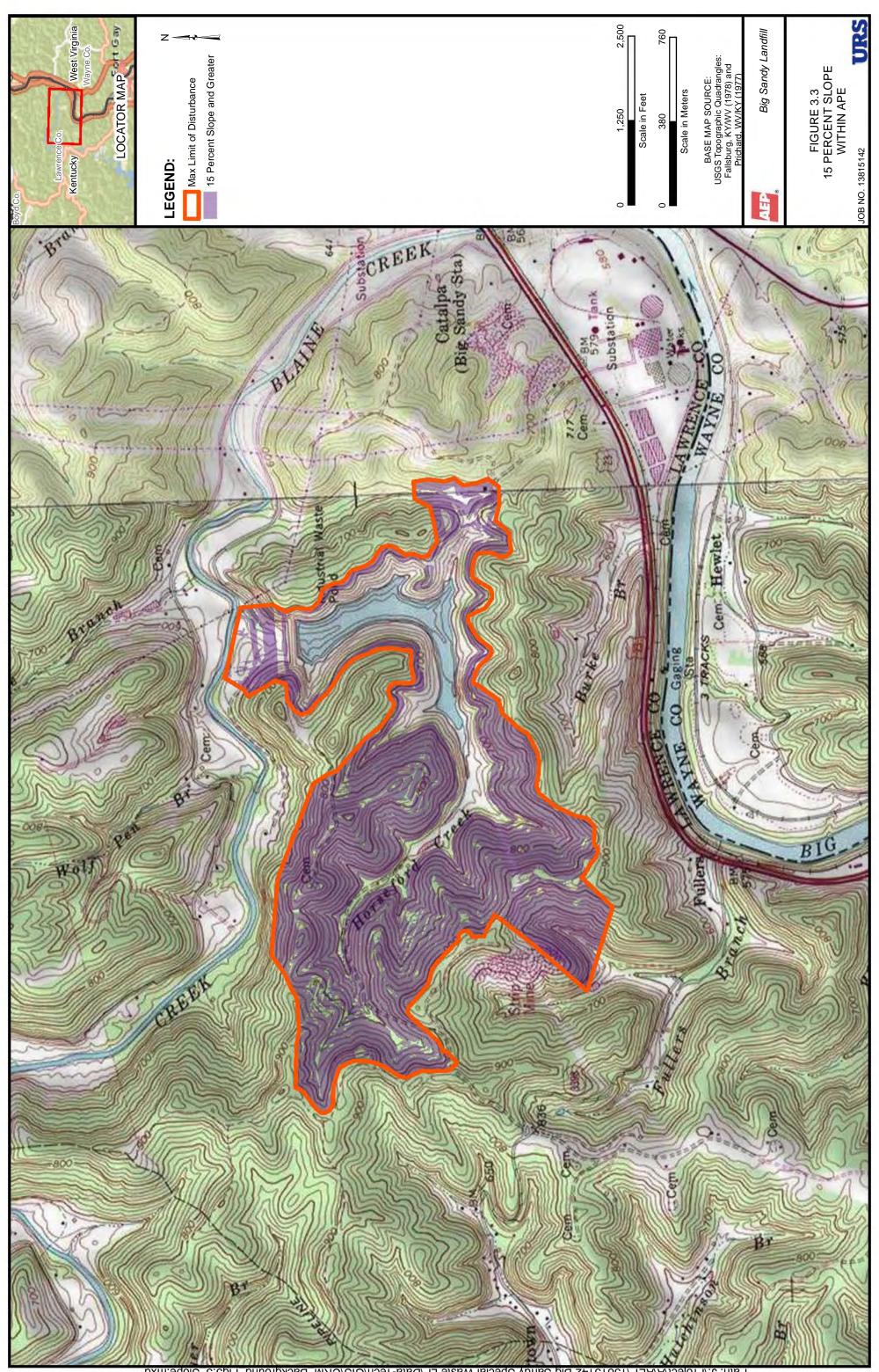
however, that steeply sloped areas would still need a visual inspection to look for caves, quarries, benches, rock faces, and rock overhangs. During the cultural resources walkover of the western portion of the APE in October 2012, URS did identify one possible rock overhang at the very western end of the APE (Plate 3.8).



Plate 3.8. Example of a Rock Overhang.

3.3 OCTOBER 2012 FIELD RESULTS

The walkover for the eastern portion of the APE was conducted on October 15 and 16, 2012, also by Mr. Goodwin. Similar to the western portion, the eastern APE contains an existing fly ash pond surrounded by steep wooded slopes (Plate 3.9). In the northern portion of this section near Blaine Creek is an existing dam (Plate 3.10). A total of two shovel tests were excavated in level areas during the walkover of this eastern portion of the APE, and these are summarized in Table 3.2 (see Figures 3.1 and 3.2 for walkover results).



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Plate 3.9. Overview of the Eastern Portion of the APE.



Plate 3.10. Overview of the Dam within the APE (photo taken north of the dam).

SL Type	SL Count (n=)		
Shovel Probe, Disturbed	1		
Shovel Probe, Negative	1		
Total	2		

Table 3.2.	Summarv	of SL [Data in	Eastern	Portion	of APE
	Sammary				1 01 01011	

Selected shovel probes were placed within the APE just north of the dam and within the easternmost portion of the APE along a ridgeline. Soil profiles north of the dam indicate that this portion of the APE is disturbed, most likely as a result of dam construction (Plate 3.11). Soils consisted of a yellowish brown (10YR 5/8) and grayish brown (10YR 5/2) silt clay loam. These disturbed soils are consistent with the web soil survey (2012) that classifies this area as Dm (dumps, mine, tailings, and tipple).



Plate 3.11. Overview of the APE just north of the Dam.

The easternmost portion of the APE is located along a level ridgeline. Soils were shallow, consisting of a 12 centimeter thick dark yellowish brown (10YR 4/4) silt clay loam, underlain by a grayish brown (10YR 5/2) and brownish yellow (10YR 6/8) clay (Plate 3.12). No cultural materials were recovered from the shovel probes.



Plate 3.12. Overview of the APE within the level ridgeline.

Similar to the western portion of the APE, the eastern portion also contained large areas of slope greater than 15 percent slope (Figure 3.3), which do not require formal Phase I cultural resources survey according to KHC guidelines (Sanders 2006). Sanders (2006:22) does suggest however, that steeply sloped areas would still need a visual inspection to look for caves, quarries, benches, rock faces, and rock overhangs. During the cultural resources walkover of the eastern portion of the APE in October 2012, URS did not identify any caves, quarries, benches, rock faces, and rock overhangs.

4.0 SUMMARY AND RECOMMENDATIONS

URS was contracted by AEP to conduct a cultural resources walkover for the Project. The purpose of this walkover was to evaluate the Project for the probability of encountering archaeological and/or historic resources, and to make recommendations for additional cultural resources work (if needed).

The Project is located approximately 4.5 miles (7.2 kilometers) north and northwest of Louisa, Kentucky, within an existing fly ash disposal area that is used for the nearby AEP Big Sandy Power Generating Facility. In an effort to effectively close the fly ash reservoir in accordance with expected but not-yet-promulgated Federal Regulations for wet CCP impoundments, it is AEP's desire to permanently close the facility by draining and capping the Big Sandy Fly Ash Pond.

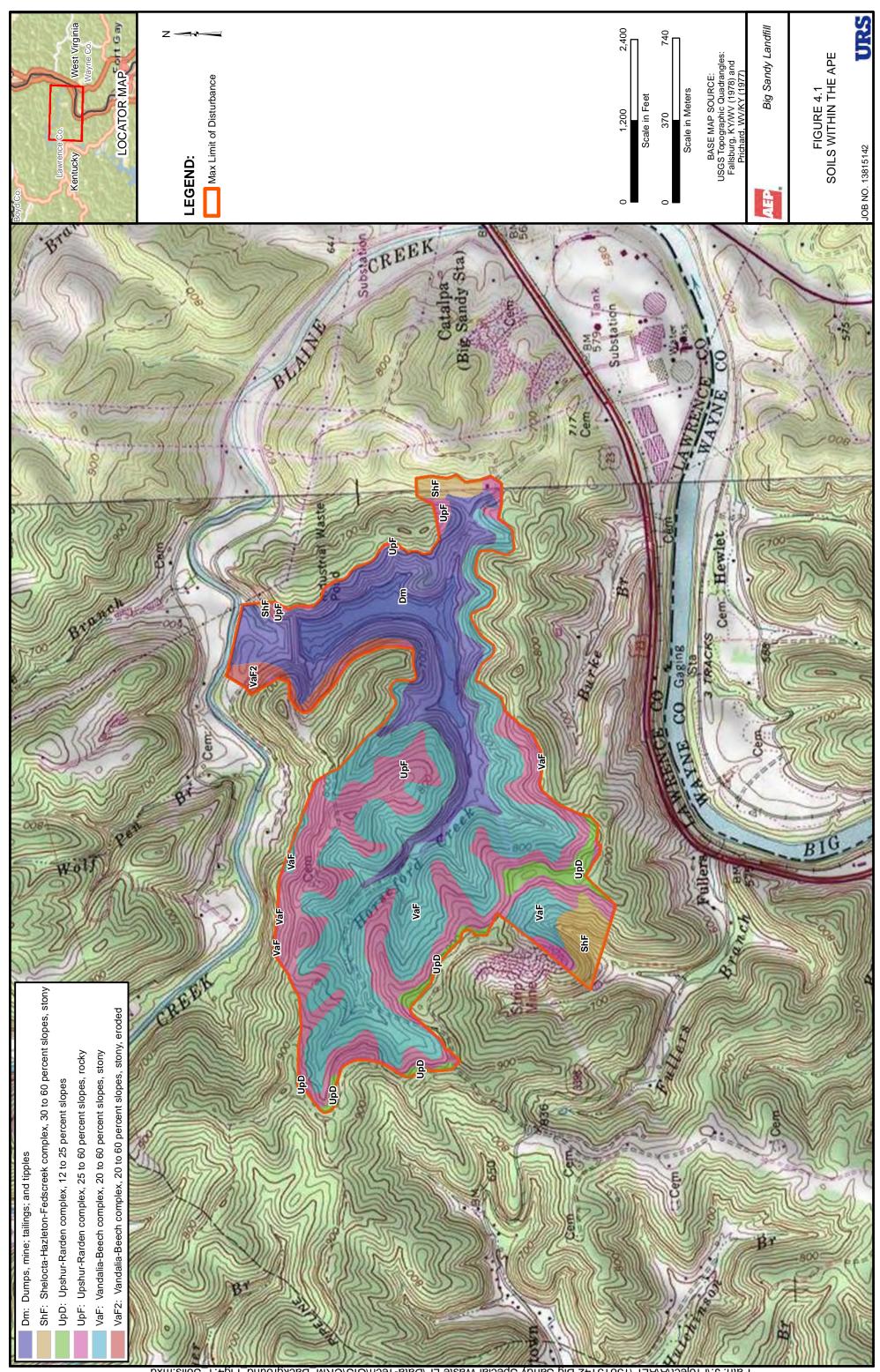
As a result of the archival research conducted in March 2012, eight archaeological sites were identified within two kilometers (1.2 miles) of the Project. Of these eight archaeological sites, most of these sites are associated with Blaine Creek to the north and are documented as unassigned prehistoric locales in floodplain or terrace settings. No historic structures or NRHP listings were previously recorded within two kilometers (1.2 miles) of the Project. One cemetery was noted within the APE from topographic mapping.

The cultural resources walkover, which was conducted in March and October 2012, indicates that large portions of the APE have been disturbed by existing facilities such as the ash pond and dam. In addition to this previous disturbance, the APE contains mostly 15 percent or greater slopes (Figure 3.3). The few level areas within the APE, especially within the western half, are either disturbed or deflated. Within the eastern half of the APE, disturbance also occurs on the floodplain north of the dam. The only portion that does not appear disturbed is the easternmost portion of the APE along a ridgeline (Figures 3.1 and 3.2).

Given the results of the background research which recorded a low number of cultural resources within two kilometers (1.2 miles) of the Project; the large degree of previous disturbance and deflation exhibited within the soils during the walkover (Figure 4.1); and that most of the APE contains slope greater than 15 percent (please reference Figure 4.1); the APE displays a low probability for containing cultural resources.

As a result, a majority of the APE would not require formal Phase I archaeological survey. In areas with steep slope near USACE jurisdictional areas, a pedestrian survey meeting the KHC guidelines may need to be conducted to identify any caves, quarries, benches, rock faces, and rock overhangs. If identified, these resources would need to be surveyed per the methodology in Sanders (2006:22). The only level area that may need formal Phase I archaeological survey would be the small portion of ridgeline in the eastern portion of the APE, located within a USACE jurisdictional area. The family cemetery that was identified within the western half of the APE should be avoided.

Because the Project involves the closure of an existing facility, there appears to be no major viewshed concerns. No architectural history survey is recommended. If the scope of the Project changes, the viewshed may need to be re-evaluated for indirect effects.



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5.0 **REFERENCES**

Sanders, Thomas N. (editor)

2006 Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports. Kentucky Heritage Council, Frankfort, KY.

Web Soil Survey

2012 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [11/13/2012].