APPENDIX M

AQUATIC RESOURCE REPORT

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WETLAND AND STREAM DELINEATION REPORT

KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

Prepared for:
Kingwood Solar I LLC

Prepared by:
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WETLAND AND STREAM DELINEATION REPORT
KINGWOOD SOLAR PROJECT
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1. Introduction

This Wetland and Stream Delineation Report summarizes the results of field work performed by Haley & Aldrich, Inc. (Haley & Aldrich) to locate and identify wetlands and streams in support of the Kingwood Solar Project (Project), a 175-megawatt (MW) solar photovoltaic facility proposed in Cedarville, Miami, and Xenia Townships, Greene County, Ohio (Figure 1).

Approximately 1,600 acres, located between Clifton Road and State Route 72 (the Study Area), was included in the field delineation effort conducted on behalf of Kingwood Solar I LLC. Most of the land is actively farmed, primarily in row crops (soybean and corn) and areas of livestock pasture. Small areas of forest, scrub shrub, and herbaceous land cover are also scattered throughout the Study Area. In addition to the numerous roadways, there are existing electric transmission and distribution lines that cross the Study Area.

2. Regulatory Authorities

2.1 WATERS OF THE UNITED STATES

As defined by the U.S. Army Corps of Engineers (USACE), Waters of the United States include lakes, ponds, streams (intermittent and perennial), and wetlands, which are regulated under Sections 401 and 404 of the Clean Water Act. Federally jurisdictional wetlands are defined as "those that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

The USACE also regulates navigable waters under Section 10 of the Rivers and Harbor Act (33 U.S.C. 401 et seq.), which requires a permit from the USACE to construct any structure in or over any navigable water of the United States, as well as any proposed action that would alter or disturb (such as excavation/dredging or deposition of materials) these waters. If the proposed structure or activity affects the course, location, condition or capacity of the navigable water, even if the proposed activity is outside the boundaries of the water body, a permit from the USACE is required.

2.2 OHIO WETLANDS AND STREAMS

The Ohio Environmental Protection Agency (Ohio EPA) Division of Surface Water regulates wetlands pursuant to Section 401 of the federal Clean Water Act. Section 401 of the Clean Water Act requires that State agencies evaluate projects that will result in the discharge of dredged or fill material into Waters of the United States to determine whether the discharge will violate the State's water quality standards. Section 401 Water Quality Certifications are issued for the discharge of dredge and fill materials to Waters of the State.

"Waters of the State" are those waters within the jurisdiction of the Ohio EPA. They are generally defined as surface and underground water bodies, which extend through or exist wholly within the State; these include, but are not limited to, streams and both isolated and non-isolated wetlands. Private ponds, or any pond, reservoir or facility built for reduction of pollutants prior to discharge are not included in this definition.

In addition to Waters of the United States, the Ohio EPA also regulates, and issues permits for isolated wetland impacts under Chapter 6111.21 of the Ohio Revised Code (ORC). The State relies on the USACE jurisdictional authority regarding wetland determinations and delineations including whether a wetland is isolated or non-isolated.

3. Methodology

Prior to initiating field investigations, Haley & Aldrich conducted a desktop review of publicly available data to evaluate the presence of mapped wetlands and streams within the Study Area. Data consulted included:

- United States Geological Survey (USGS) topographic quadrangle maps;
- United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps;
- Natural Resources Conservation Service (NRCS) Web Soil Survey;
- Federal Emergency Management Agency (FEMA) Flood Insurance maps;
- the National Hydrography Dataset (NHD);
- Ohio Wetlands Inventory; and
- Recent aerial photography.

The wetland and stream delineation field survey was performed in accordance with criteria set forth in the *Corps of Engineers Wetland Delineation Manual* [(Environmental Laboratory, 1987) (Manual)] and the *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* [(Version 2.0) (USACE, 2010) (Supplement)]. Data was collected from one or more sample plots in each delineated wetland (depending on the size of the delineated area) and were recorded on USACE Wetland Determination Data forms. The boundaries of wetlands were demarcated with pink survey ribbon (flagging) and located with a Trimble TDC150 GPS unit with reported sub-meter accuracy.

Hydrology was evaluated based on indicators that are divided into two categories: primary and secondary. The 1987 Manual and 2010 Supplement define hydrology as present when at least one primary indicator or two secondary indicators are identified. One primary indicator is sufficient to evaluate whether hydrology is present; however, if primary indicators are absent, two or more secondary indicators are required to evaluate hydrology. If other potential hydrology evidence was found (e.g., moss trim lines or microtopographic relief), then this was subsequently documented on the Wetland Determination Data Form.

Hydrophytic vegetation was assessed by identifying plant species and their assigned wetland indicator rating of obligate, facultative wet, facultative, facultative upland or upland, according to the *2018 National Wetland Plant List* (USACE, 2016). Vegetation in both upland and wetland communities was characterized using the areal dominance method, with a 30-feet radius around the soil sample location for trees, a 15-feet radius for saplings/shrubs, and a five feet radius for herbaceous plants.

Hydric soil indicators were evaluated using soil characteristics, as defined in *Field Indicators of Hydric Soils in the United States (Version 8.0)* (NRCS, 2016). Evidence of hydric soil indicators were recorded based on the presence of color matrix, hue, and redoximorphic features, such as saturation, gleyed matrix, mottling, hydrogen sulfide odor, and organic/peat layers. Soil test pits were dug using a shovel to a depth of approximately 18 inches, or refusal due the presence of hard pan layer, rock or hard fill materials. Soil color was described using the Munsell Color book; soil texture was determined using USDA hand-texture methods and the presence/absence of redoximorphic features, including depletions and concentrations.

Wetlands were classified based on the Cowardin classification system (Cowardin, *et al.*, 1979). This system includes classifications for Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), and Palustrine Forested (PFO) wetlands. Within PEM wetlands, emergent plants make up at least 30 percent aerial coverage and are the tallest life form. Within PSS wetlands, woody plants less than 20-feet tall are the dominant life form. PFO wetlands are dominated by woody plants at least 20-feet tall.

Wetlands were also evaluated using the *Ohio Rapid Assessment Method (ORAM) for Wetlands v. 5.0* (Mack, 2001). The ORAM process focuses on an assessment of delineated wetlands, as opposed to the boundary of wetlands. The ORAM assessment utilizes scoring forms to determine the ecological and functional value of a particular wetland. The ORAM was developed to provide a relatively fast and easy method for determining the appropriate category of a wetland under the Wetland Anti-Degradation Rule, Ohio Administrative Code (OAC) Rule 3745-1-54. These regulations specify three wetland categories: Category 1, Category 2, and Category 3, which correspond to low-, medium-, and high-quality wetlands, respectively.

Additional surface waters, including stream channels and drainage ways, found during field work were investigated, flagged, and located with GPS. Delineated streams were characterized on the Stream Inventory Data Form, as well as the Primary Headwater Habitat Evaluation Form (Ohio EPA, 2012) and Qualitative Habitat Evaluation Index and Use Assessment Field Sheet, as necessary. To the extent practicable, these surface waters were investigated to evaluate drainage patterns and potential connections to other Waters of the United States.

Streams were classified as either ephemeral, intermittent, or perennial. A perennial stream has flowing water year-round during a typical year and they are generally identified as solid blue lines on the USGS topographic maps. An intermittent stream has flowing water during certain times of the year when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Intermittent streams are generally identified as dashed blue lines on the USGS topographic maps. An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral streams are not identified on USGS topographic maps. These desktop classifications were refined based on observed conditions on site (e.g., flowing water unrelated to recent precipitation in an unmapped stream would be classified as intermittent).

4. Site Setting

4.1 PHYSIOGRAPHY AND SOILS

The Study Area is located in the Till Plains section of the larger Central Lowlands physiographic province. This region generally consists of a gently rolling landscape with major changes in relief in areas along streams, in small areas of terraces, and moraines. Elevation within the Study Area ranges from approximately 920 feet above mean sea level (amsl) in the western portion of the Study Area to approximately 1,080 feet amsl along Harbison Road in the southeastern portion of the Study Area (USGS, 2021). A topographic map of the Study Area and surrounding region is provided as Figure 2.

Based on NRCS data (NRCS 2021), soil series units, drainage class, hydric classification identified by the NRCS web soil survey are listed in Table 1, in order of prevalence within the Study Area, and provided as Figure 2.

Table 1. Study Area Soils

Soil Map Unit Symbol	Soil Map Unit Name	Percentage of Study Area	Drainage Class	Hydric Classification[1]
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	17.5	Moderately well drained	Not Hydric
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	15.6	Poorly drained	Hydric
FnA	Fincastle silt loam, southern ohio till plain, 0 to 2 percent slopes	8.8	Somewhat poorly drained	Not Hydric
RvB	Russell-Miamian silt loams, 2 to 6 percent slopes	8.1	Well drained	Not Hydric
RtA	Rush silt loam, 0 to 2 percent slopes	4.4	Well drained	Not Hydric
EmB	Eldean silt loam, 2 to 6 percent slopes	3.8	Well drained	Not Hydric
So	Sloan silty clay loam	3.3	Very poorly drained	Hydric
Bs	Brookston silty clay loam, fine texture, 0 to 2 percent slopes	3.1	Poorly drained	Hydric
RtB	Rush silt loam, 2 to 6 percent slopes	3.0	Well drained	Not Hydric
MtB	Milton silt loam, 2 to 6 percent slopes	3.0	Well drained	Not Hydric
MtC2	Milton silt loam, 6 to 12 percent slopes, moderately eroded	2.8	Well drained	Not Hydric
CeB	Celina silt loam, 2 to 6 percent slopes	2.6	Moderately well drained	Not Hydric
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	2.6	Well drained	Not Hydric
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	2.4	Well drained	Not Hydric
MhC2	Miamian silt loam, 6 to 12 percent slopes, moderately eroded	2.2	Well drained	Not Hydric
EmC2	Eldean silt loam, 6 to 12 percent slopes, moderately eroded	1.6	Well drained	Not Hydric
Ee	Eel loam	1.4	Moderately well drained	Hydric
ThA	Thackery silt loam, 0 to 2 percent slopes	1.2	Moderately well drained	Not Hydric
XeA	Xenia silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	1.2	Moderately well drained	Not Hydric
CcD2	Casco-Eldean loams, 12 to 18 percent slopes, moderately eroded	1.1	Well drained	Not Hydric
Ms	Millsdale silty clay loam, 0 to 2 percent slopes	1.1	Very poorly drained	Hydric
Ag	Algiers silt loam	1.0	Somewhat poorly drained	Not Hydric
ReA	Reesville silt loam, 0 to 2 percent slopes	1.0	Somewhat poorly drained	Not Hydric
RhD	Ritchey silt loam, 12 to 18 percent slopes	0.9	Well drained	Not Hydric
OcA	Ockley silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.9	Well drained	Not Hydric
EmA	Eldean silt loam, 0 to 2 percent slopes	0.8	Well drained	Not Hydric
MhB2	Miamian silt loam, 2 to 6 percent slopes, eroded	0.8	Well drained	Not Hydric
BbB	Birkbeck silt loam, 1 to 4 percent slopes	0.7	Moderately well drained	Not Hydric
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.7	Somewhat poorly drained	Hydric
MtA	Milton silt loam, 0 to 2 percent slopes	0.4	Well drained	Not Hydric
RhE2	Ritchey silt loam, 18 to 25 percent slopes, moderately eroded	0.4	Well drained	Not Hydric
SlA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.4	Somewhat poorly drained	Not Hydric
CdE2	Casco-Rodman loams, 18 to 50 percent slopes, moderately eroded	0.3	Well drained	Not Hydric

Soil Map Unit Symbol	Soil Map Unit Name	Percentage of Study Area	Drainage Class	Hydric Classification[1]
MoC2	Miamian-Eldean silt loams, 6 to 12 percent slopes, moderately eroded	0.2	Well drained	Not Hydric
ThB	Thackery silt loam, 2 to 6 percent slopes	0.2	Moderately well drained	Not Hydric
RuA	Russell silt loam, 0 to 2 percent slopes	0.1	Well drained	Not Hydric
MhB	Miamian silt loam, 2 to 6 percent slopes	0.1	Well drained	Not Hydric
RdA	Raub silt loam, 0 to 2 percent slopes	0.1	Somewhat poorly drained	Not Hydric
RbA	Randolph silt loam, 0 to 2 percent slopes	0.1	Somewhat poorly drained	Not Hydric
MUF	Milton soils, channery variant, 25 to 50 percent slopes	0.1	Well drained	Not Hydric
RhB	Ritchey silt loam, 2 to 6 percent slopes	<0.1	Well drained	Not Hydric
OcB2	Ockley silt loam, 2 to 6 percent slopes, moderately eroded	<0.1	Well drained	Not Hydric
RhC	Ritchey silt loam, 6 to 12 percent slopes	<0.1	Well drained	Not Hydric
EmB2	Eldean silt loam, 2 to 6 percent slopes, moderately eroded	<0.1	Well drained	Not Hydric
Ws	Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes	<0.1	Poorly drained	Hydric
MlD3	Miamian clay loam, shallow to dense till substratum, 12 to 18 percent slopes, severely eroded	<0.1	Well drained	Not Hydric

Note:

[1] Soils mapping source: USDA, Natural Resource Conservation Service (NRCS) Web Soil Survey (accessed March 30, 2021).

Descriptions of each soil series comprising at least five percent of the Study Area, in order of prevalence, are provided below. See Figure 2 for mapping of all soil map units located within the Study Area.

- **Xenia Series:** The Xenia series consists of nearly level to gently sloping, moderately well drained soils located on uplands. These soils have a seasonal high-water table for short periods in the winter and spring. These soils are well suited to farming and are not classified as hydric.
- **Ragsdale Series**: The Ragsdale series consists of deep, nearly level, poorly drained soil that is mainly found in upland depressions. These soils are saturated with water for a significant period in winter and spring, and they are slow to dry out unless they are artificially drained. These soils are classified as hydric.
- **Russell Series**: The Russell series consists of deep, nearly level to gently sloping, well drained soils located on uplands. Water rarely ponds on the surface for extended periods. These soils are typically farmed and are not classified as hydric.
- **Fincastle Series:** The Fincastle series consists of nearly level, somewhat poorly drained soils located on uplands. Runoff is slow and water ponds on some more level areas for short periods. These soils have a high water table for long periods in winter and early in spring. They are slow to dry out in spring unless they are drained. These soils are mostly used for cultivated crops and are not classified as hydric.
- **Rush Series**: The Rush series consists of deep, nearly level to gently sloping, well drained soils located on outwash plains and terraces. Runoff is slow to medium but water rarely ponds on these soils for extended periods. These soils are used for cultivated crops and are not classified as hydric.
- **Eldean Series**: The Eldean series consists of nearly level to moderately steep, well drained soils. These soils are found along drainageways on stream terraces and on gravel knolls on uplands. Eldean soils dry out early in spring. These soils are commonly used for cultivated crops and are not classified as hydric.
- **Milton Series**: The Milton series consists of nearly level to sloping, well drained, moderately deep soils over limestone bedrock at a depth of 20 to 40 inches. The underlying bedrock is fractured and water moves rapidly through it. These soils are used mostly for crops, pasture, or woodland and are not classified as hydric.

4.2 HYDROLOGY

The Study Area is located in the Little Miami Watershed (USGS HUC 05090202). The major streams located in this watershed include the Little Miami River, Massies Creek, Caesar Creek, O'Bannon Creek, and East Fork Little Miami River. The Little Miami River flows southwest to its confluence with the Ohio River.

The majority of surface hydrology within the Study Area is generated by precipitation and surface water sheet flow from adjacent areas at higher elevations. The Study Area has an average annual precipitation of 41.84 inches, as measured in nearby Xenia, Ohio (NCDC, 2021).

There are three NWI wetlands mapped within the Study Area: one freshwater emergent wetland (NWI code: PEM1A) and two riverine wetlands (NWI codes: R4SBC and R5UBH). The riverine wetlands coincide with Clark Run.

The Ohio Wetlands Inventory indicates the potential presence of numerous, relatively small wetlands throughout the Study Area. These include Woods on Hydric Soil, Scrub/Shrub Wetland, and Wet Meadow. Most of these areas occur within active cropland, small woodlots or are associated with Clark Run. State and federally mapped aquatic resources within the Study Area are summarized in Table 2 and depicted on Figure 3.

Table 2. State and Federally Mapped Wetland and Streams within Study Area

Code	Wetland Type	Status
PEM1A	Freshwater Emergent Wetland	No official state or federal status
R4SBC	Riverine	No official state or federal status
R5UBH	Riverine	No official state or federal status
34 (20 occurrences)	Woods on Hydric Soil	No official state or federal status
37 (6 occurrences)	Scrub/shrub Wetland	No official state or federal status
38 (16 occurrences)	Wet Meadow	No official state or federal status

5. Results

Field investigations to delineate wetlands and streams within the Study Area were completed by Haley & Aldrich wetland scientists on October 13 – 21, 2020; November 17 – 18, 2020; and March 8 –11, 2021. A total of six wetlands and 27 stream segments were identified. Delineated wetlands and streams are summarized in Tables 3 and 4, respectively, and are depicted on Figure 4.

5.1 DELINEATED WETLANDS

Five palustrine emergent (PEM) wetlands were delineated within the Study Area (Wetlands MMC, MMD, MMG, MMH, and MMI). The observed indicators of wetland hydrology in these wetlands included Surface Water (A1), Water-Stained Leaves (B9), Oxidized Rhizospheres on Living Roots (C3), Geomorphic Position (D2), and Drainage Patters (B10). The dominant vegetation in these areas included reed canary grass (*Phalaris arundinacea*), pink smartweed (*Persicaria pensylvanica*), shoreline sedge (*Carex hyalinolepis*), lakebank sedge (*Carex lacustris*), common boneset (*Eupatorium perfoliatum*), and cursed crowfoot (*Ranunculus sceleratus*). The observed hydric soil indicators included Depleted Matrix (F3), Depleted Below Dark Surface (A11), and Redox Dark Surface (F6).

One palustrine forested (PFO) wetland was delineated within the Study Area (Wetland MME). The observed indicators of hydrology in this wetland included Water-Stained Leaves (B9) and Oxidized Rhizospheres on Living Roots (C3). The dominant vegetation included green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), arrowwood viburnum (*Viburnum dentatum*), slippery elm (*Ulmus rubra*), poison ivy (*Toxicodendron radicans*), and common red raspberry (*Rubus idaeus*). The observed hydric soil indicator was Depleted Matrix (F3).

Table 3 contains the complete inventory of wetlands delineated in the Study Area. Representative photos of each wetland are included in Appendix A; a brief description of each delineated wetland is included in Appendix B; and all completed Wetland Determination Data Forms are provided in Appendix C. Wetland community type was classified according to the Cowardin classification (Cowardin, *et al*., 1979).

Table 3. Delineated Wetlands

Wetland ID	Wetland Community[1]	Delineated Area[2] (acres)	ORAM Category	Presumed Jurisdiction[3]
Wetland MMC	PEM	0.04	1	USACE
Wetland MMD	PEM	0.13	1	Ohio EPA
Wetland MME	PFO	0.88	2	Ohio EPA
Wetland MMG	PEM	0.29	2	USACE
Wetland MMH	PEM	0.06	1	USACE
Wetland MMI	PEM	0.12	2	USACE

Notes:

[1] Wetland classifications are based on the Cowardin classification system whereby: P = Palustrine; EM = Emergent; SS = Shrub Scrub; FO = Forested.

[2] Area of delineated wetlands presented on Figure 4 represent the entire wetland area identified during field investigations and may include small areas outside of the actual Study Area limits.

[3] If necessary, final federal and state jurisdiction can only be confirmed through consultation with USACE and Ohio EPA staff.

5.2 DELINEATED STREAMS

Fourteen ephemeral streams were delineated within the Study Area (Streams MM2, MM3, MM7, MM8, MM9, MM10, MM11, MM12, MM13, MM15, MM16, MM17, MM26, and MM27). These channels were generally observed to be 2 to 3 feet wide with no flow at the time of field investigations. Channel substrates included silt, cobble, and clay.

Nine intermittent streams were delineated within the Study Area (Streams MM4, MM5, MM6, MM19, MM20, MM22, MM23, MM24, and MM25). These streams were generally observed to be 3 to 6 feet wide with depths ranging from no flow to 5 inches deep. Channel substrates included cobble, boulder, and silt.

One perennial stream (Clark Run) was delineated within the Study Area (four separate reaches delineated as MM1, MM14, MM18, and MM21). This stream flows through pasture and was approximately 7 to 10 feet wide and 8 to 24 inches deep. Channel substrates included cobble, boulder, and silt.

Table 4 below contains a summary of streams delineated within the Study Area. Representative photos of each stream are included in Appendix A; a brief description of each delineated stream is included in Appendix B; and all completed Stream Data Inventory Forms are provided in Appendix C.

Table 4. Delineated Streams

Stream ID	Stream Type[1]	Delineated Length (feet)[2]	HHEI Score	Presumed Jurisdiction[3]
Stream MM1 (Clark Run)	Perennial	2,405	73	USACE
Stream MM2	Ephemeral	325	37	Ohio EPA
Stream MM3	Ephemeral	490	22	Ohio EPA
Stream MM4	Intermittent	930	56	USACE
Stream MM5	Intermittent	755	38	USACE
Stream MM6	Intermittent	1,670	63	USACE
Stream MM7	Ephemeral	70	17	Ohio EPA
Stream MM8	Ephemeral	60	17	Ohio EPA
Stream MM9	Ephemeral	1,675	27	Ohio EPA
Stream MM10	Ephemeral	190	37	Ohio EPA
Stream MM11	Ephemeral	1,535	33	Ohio EPA
Stream MM12	Ephemeral	210	22	Ohio EPA
Stream MM13	Ephemeral	390	33	Ohio EPA
Stream MM14 (Clark Run)	Perennial	2,435	68	USACE
Stream MM15	Ephemeral	220	32	Ohio EPA
Stream MM16	Ephemeral	305	25	Ohio EPA
Stream MM17	Ephemeral	356	10	Ohio EPA
Stream MM18 (Clark Run)	Perennial	317	64	USACE
Stream MM19	Intermittent	435	61	USACE
Stream MM20	Intermittent	580	55	USACE

Stream ID	Stream Type[1]	Delineated Length (feet)[2]	HHEI Score	Presumed Jurisdiction[3]
Stream MM21 (Clark Run)	Perennial	1,240	76	USACE
Stream MM22	Intermittent	317	31	USACE
Stream MM23	Intermittent	692	60	USACE
Stream MM24	Intermittent	78	21	USACE
Stream MM25	Intermittent	133	22	USACE
Stream MM26	Ephemeral	100	37	Ohio EPA
Stream MM27	Ephemeral	374	32	Ohio EPA

Notes:

[1] Stream type includes perennial, intermittent and ephemeral. A perennial stream has flowing water year-round during a typical year. Perennial streams are generally identified as solid blue lines on the USGS Topographic maps. An intermittent stream has flowing water during certain times of the year when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Intermittent streams are generally identified as dashed blue lines on the USGS Topographic maps. An ephemeral drain has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral drains are not identified on USGS Topographic maps.

[2] Length of delineated wetlands presented on Figure 4 represent the entire stream length identified during field investigations and may include small areas outside of the actual Study Area limits.

[3] If necessary, final federal and state jurisdiction can only be confirmed through consultation with USACE and Ohio EPA.

6. Conclusions

A total of six wetlands and 27 stream segments were delineated during the field investigations conducted by Haley & Aldrich in October and November 2020 and March 2021. Haley & Aldrich's analysis suggests the Wetlands MMD and MME appear to be isolated and, as such, are likely to be considered jurisdictional by the Ohio EPA. The remaining wetlands appear likely to have hydrological connections to other Waters of the United States and would likely be considered jurisdictional by the USACE. The delineated intermittent and perennial streams are also likely to be considered jurisdictional by the USACE. The ephemeral streams identified within the Study Area are unlikely to be considered jurisdictional by the USACE; however, the Ohio EPA would likely take jurisdiction of these streams. If necessary, it is recommended that a final determination of jurisdictional status be made through consultation with the USACE and Ohio EPA.

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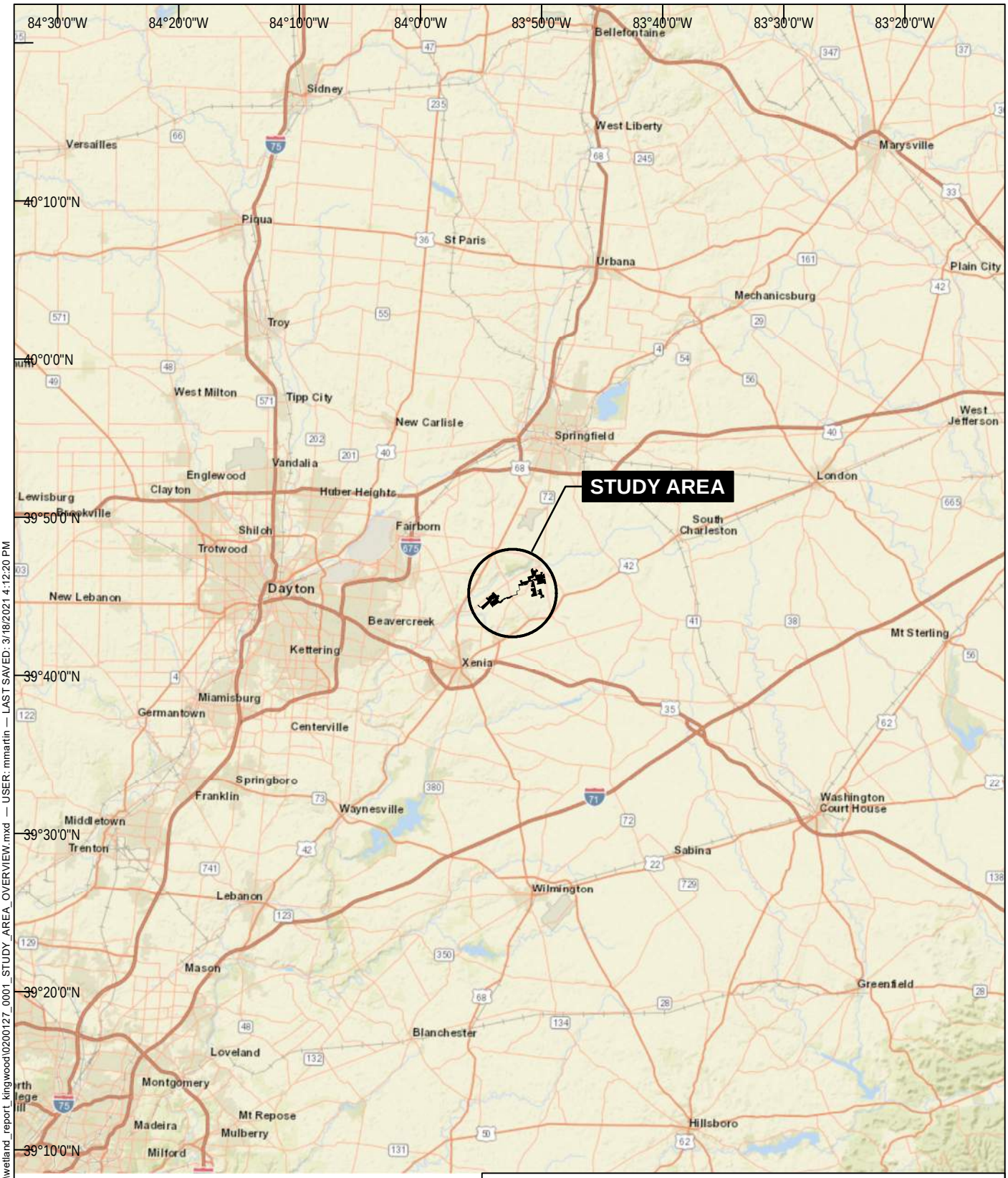
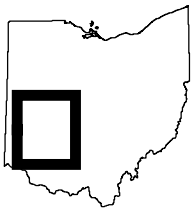
FIGURES





0 5 10
SCALE IN MILES

MAP SOURCE: ESRI
SITE COORDINATES: 39°46'07"N, 83°52'38"W

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

STUDY AREA OVERVIEW

APPROXIMATE SCALE: 1 IN = 10 MI
MARCH 2021

FIGURE 1

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0001_STUDY_AREA_OVERVIEW.mxd — USER: mmartin — LAST SAVED: 3/18/2021 4:12:20 PM

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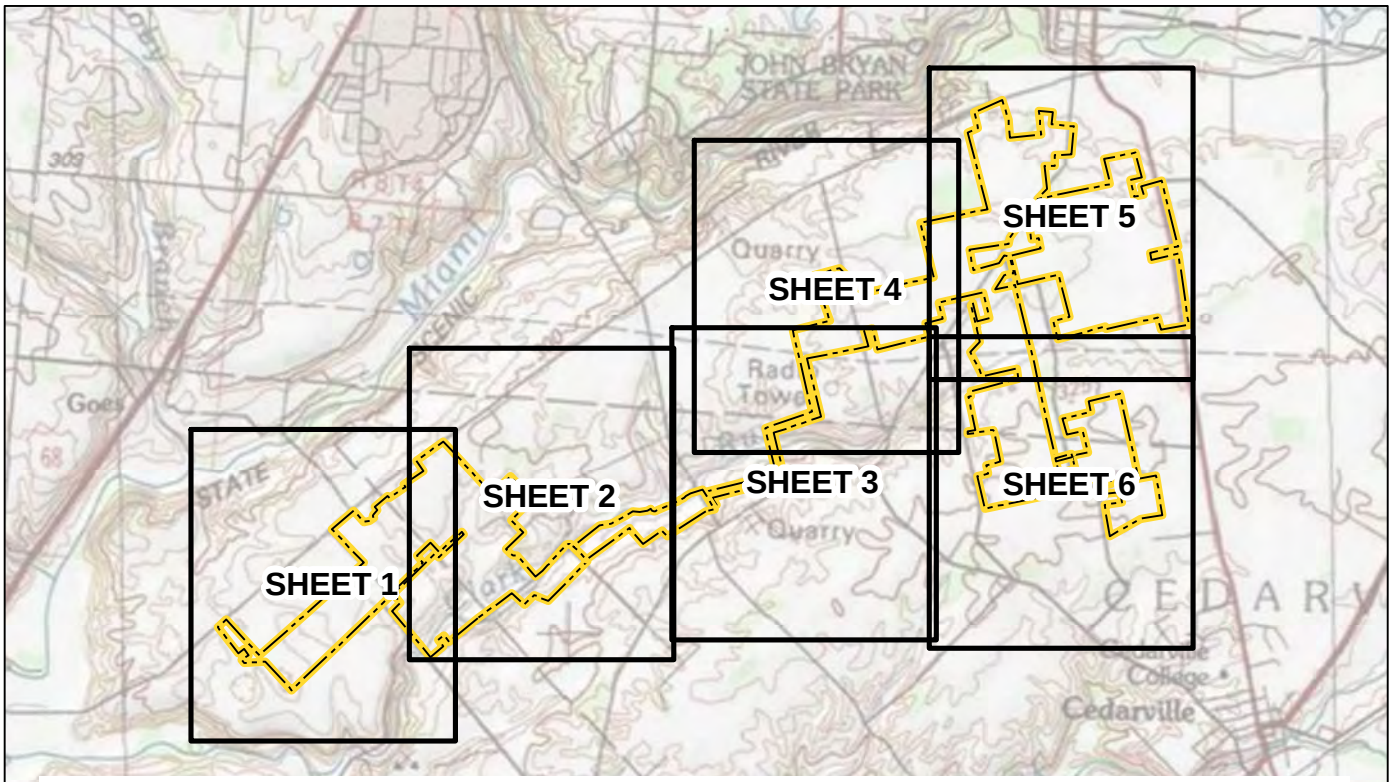

STUDY AREA SOILS

- Ag - Algiers silt loam
- BbB - Birkbeck silt loam, 1 to 4 percent slopes
- Bs - Brookston silty clay loam, fine texture, 0 to 2 percent slopes
- CcD2 - Casco-Eldean loams, 12 to 18 percent slopes, moderately eroded
- CdE2 - Casco-Rodman loams, 18 to 50 percent slopes, moderately eroded
- CeB - Celina silt loam, 2 to 6 percent slopes
- CrA - Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes
- Ee - Eel loam
- EmA - Eldean silt loam, 0 to 2 percent slopes
- EmB - Eldean silt loam, 2 to 6 percent slopes
- EmB2 - Eldean silt loam, 2 to 6 percent slopes, moderately eroded
- EmC2 - Eldean silt loam, 6 to 12 percent slopes, moderately eroded
- FnA - Fincastle silt loam, southern ohio till plain, 0 to 2 percent slopes
- MUF - Milton soils, channery variant, 25 to 50 percent slopes
- MhB - Miamian silt loam, 2 to 6 percent slopes
- MhB2 - Miamian silt loam, 2 to 6 percent slopes, eroded
- MhC2 - Miamian silt loam, 6 to 12 percent slopes, moderately eroded
- MlD3 - Miamian clay loam, shallow to dense till substratum, 12 to 18 percent slopes, severely eroded
- MoC2 - Miamian-Eldean silt loams, 6 to 12 percent slopes, moderately eroded
- Ms - Millsdale silty clay loam, 0 to 2 percent slopes
- MtA - Milton silt loam, 0 to 2 percent slopes
- MtB - Milton silt loam, 2 to 6 percent slopes
- MtC2 - Milton silt loam, 6 to 12 percent slopes, moderately eroded
- OcA - Ockley silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes
- OcB - Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes
- OcB2 - Ockley silt loam, 2 to 6 percent slopes, moderately eroded
- Ra - Ragsdale silty clay loam, 0 to 2 percent slopes
- RbA - Randolph silt loam, 0 to 2 percent slopes
- RdA - Raub silt loam, 0 to 2 percent slopes
- ReA - Reesville silt loam, 0 to 2 percent slopes
- RhB - Ritchey silt loam, 2 to 6 percent slopes
- RhC - Ritchey silt loam, 6 to 12 percent slopes
- RhD - Ritchey silt loam, 12 to 18 percent slopes
- RhE2 - Ritchey silt loam, 18 to 25 percent slopes, moderately eroded
- RtA - Rush silt loam, 0 to 2 percent slopes
- RtB - Rush silt loam, 2 to 6 percent slopes
- RuA - Russell silt loam, 0 to 2 percent slopes
- RvB - Russell-Miamian silt loams, 2 to 6 percent slopes
- RvB2 - Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded
- SlA - Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes
- So - Sloan silty clay loam
- ThA - Thackery silt loam, 0 to 2 percent slopes
- ThB - Thackery silt loam, 2 to 6 percent slopes
- Ws - Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes
- XeA - Xenia silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes
- XeB - Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes

LEGEND

STUDY AREA

N

0 0.5 1
Miles

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR 1 LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
INDEX SHEET

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS_INDEX.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:14:14 PM

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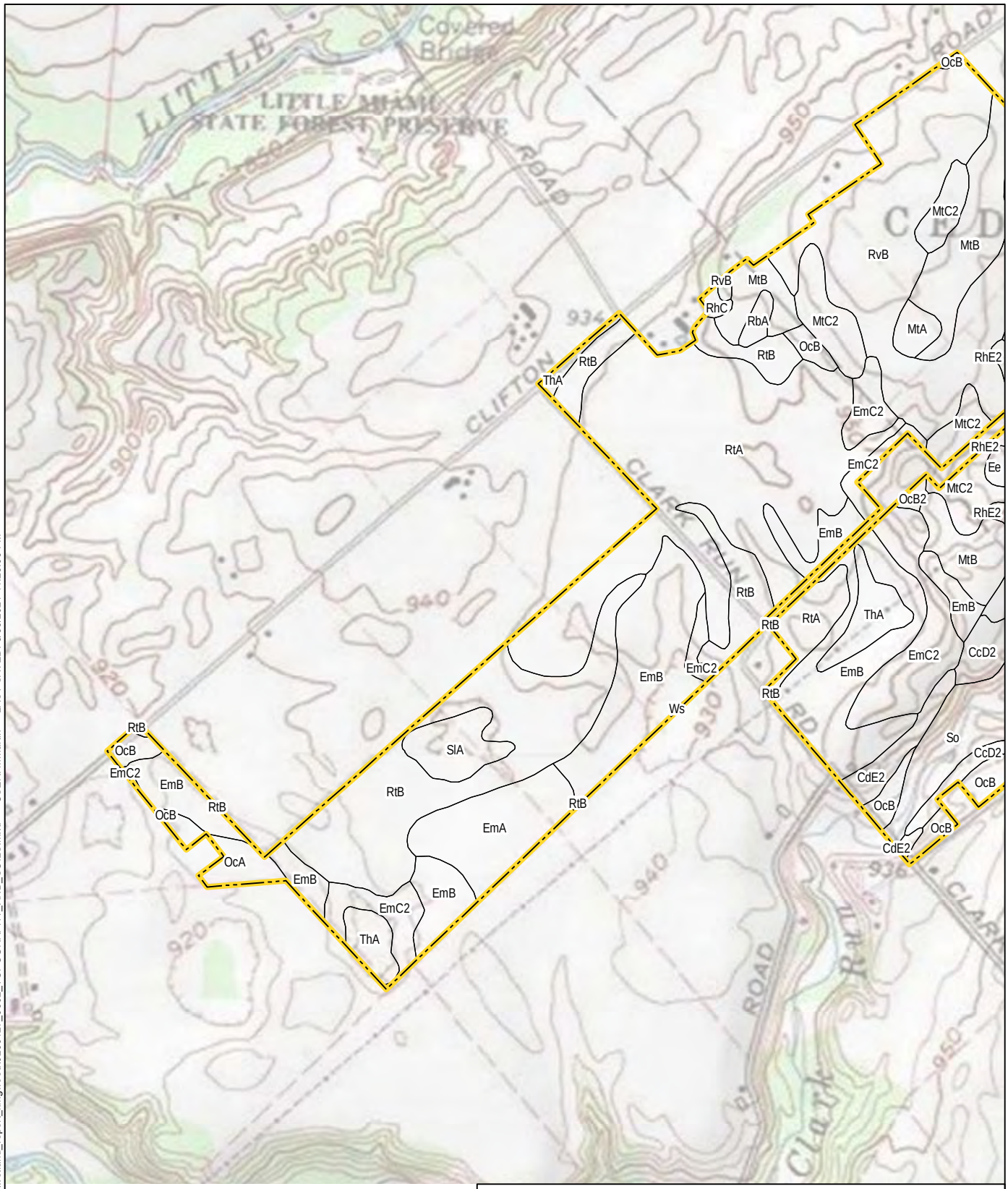

LEGEND

STUDY AREA

N

0 500 1,000
SCALE IN FEET

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 1 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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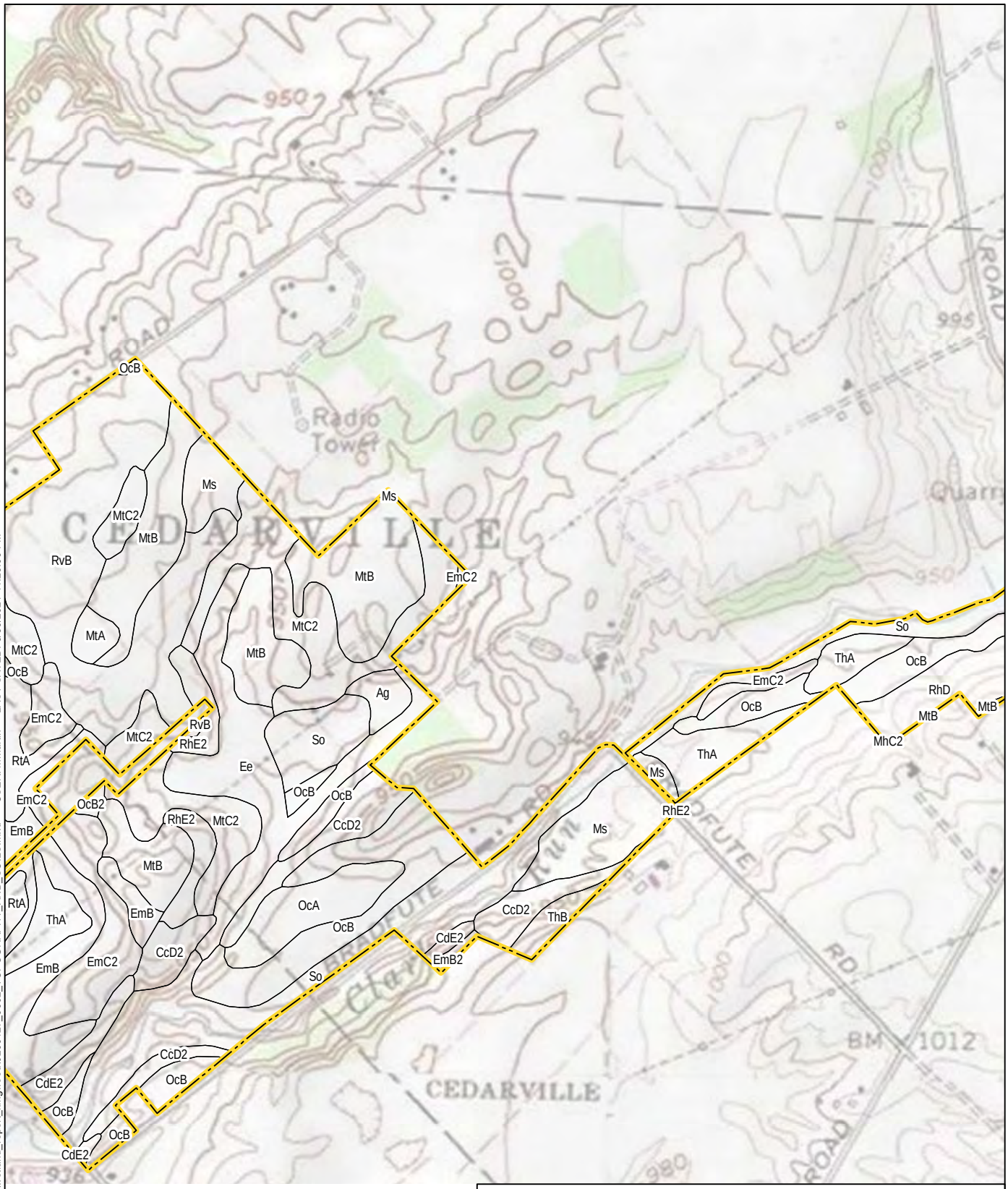

LEGEND

STUDY AREA

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

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KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 2 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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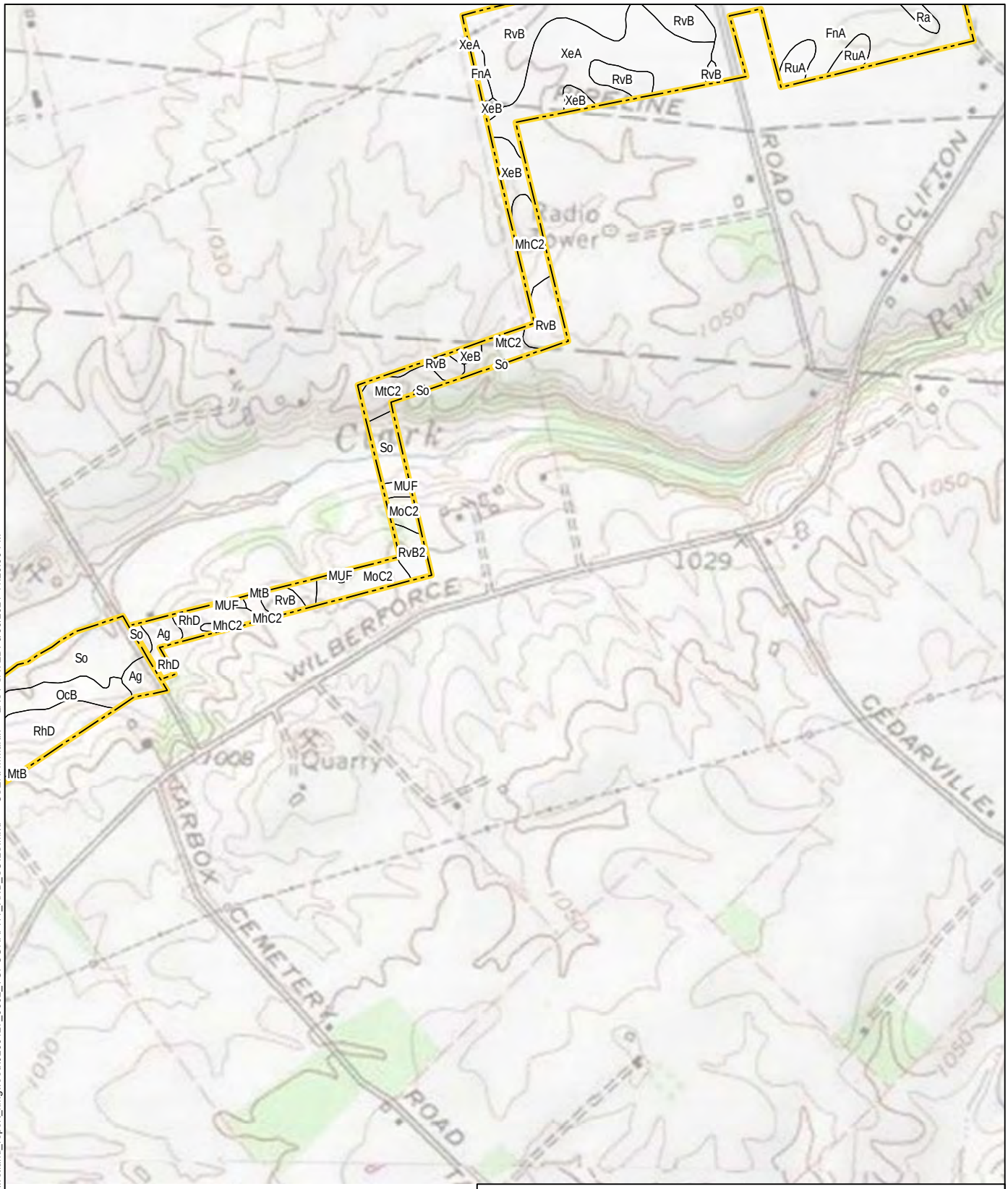

LEGEND

STUDY AREA

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 3 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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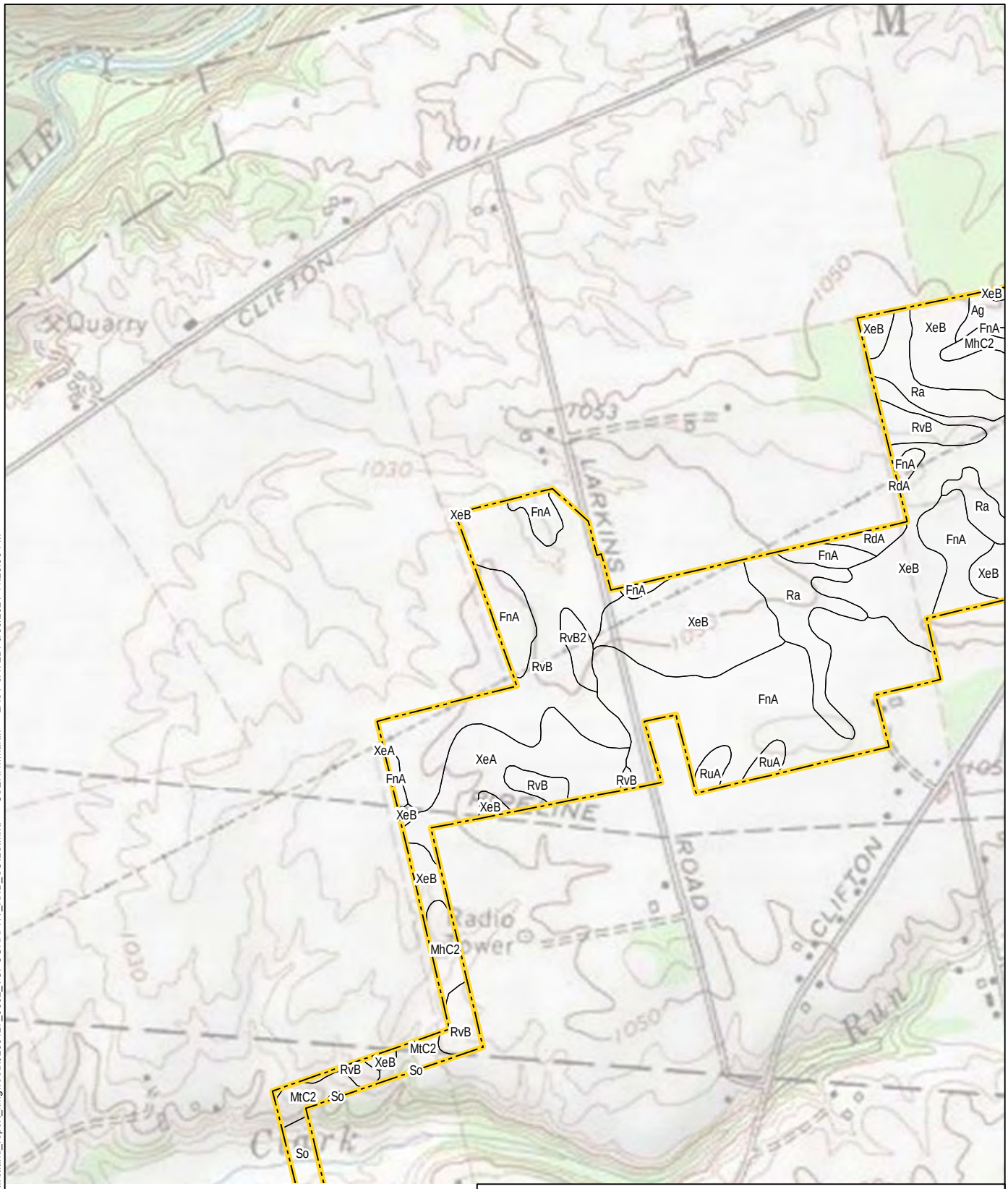

LEGEND

STUDY AREA

N

0 500 1,000
SCALE IN FEET

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 4 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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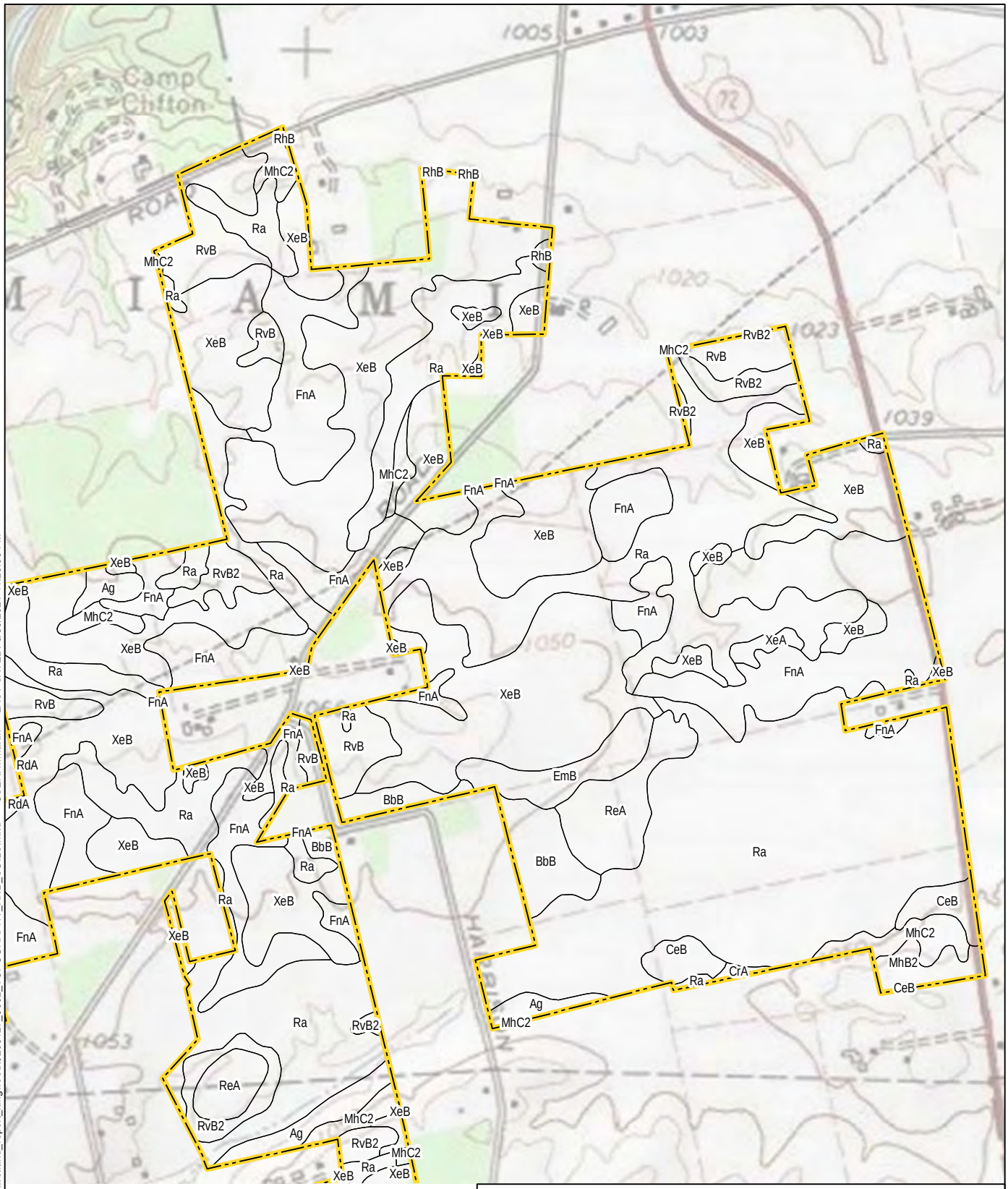

LEGEND

STUDY AREA

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 5 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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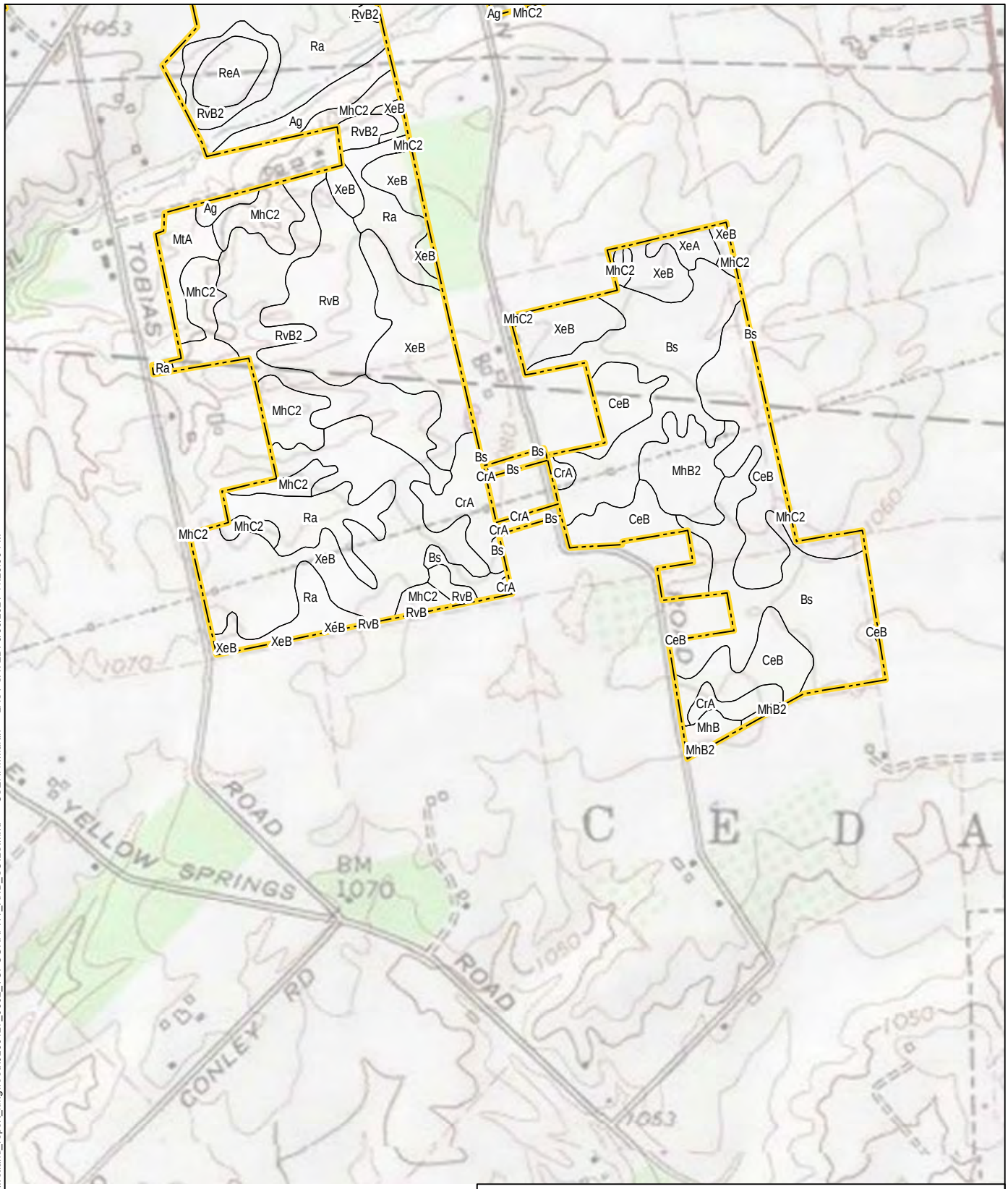

LEGEND

STUDY AREA

N

0 500 1,000

SCALE IN FEET

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

TOPOGRAPHY AND SOILS

SCALE: AS SHOWN
MARCH 2021

FIGURE 2
SHEET 6 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0002_TOPOGRAPHY_AND_SOILS.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:20:09 PM

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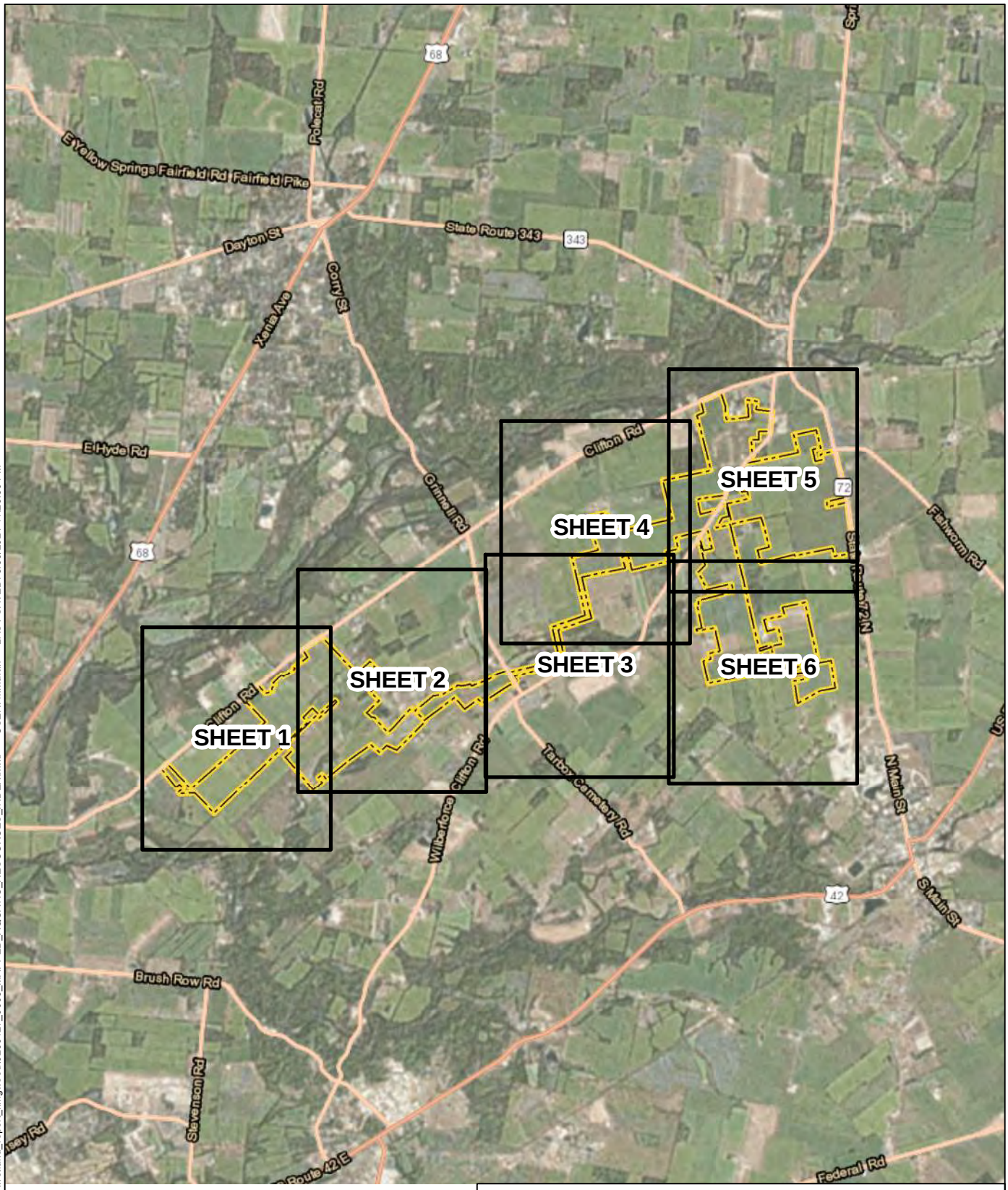

INDEX SHEET

STUDY AREA

N

0 0.5 1
Miles

NOTES
1. AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
INDEX SHEET

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES_INDEX.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:29:56 PM

DRAFT

OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

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GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 1 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM

DRAFT

OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

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KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 2 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM

DRAFT

OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

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KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 3 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM

DRAFT

OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 4 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM

DRAFT

OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES
1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

HALEY ALDRICH

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KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 5 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM

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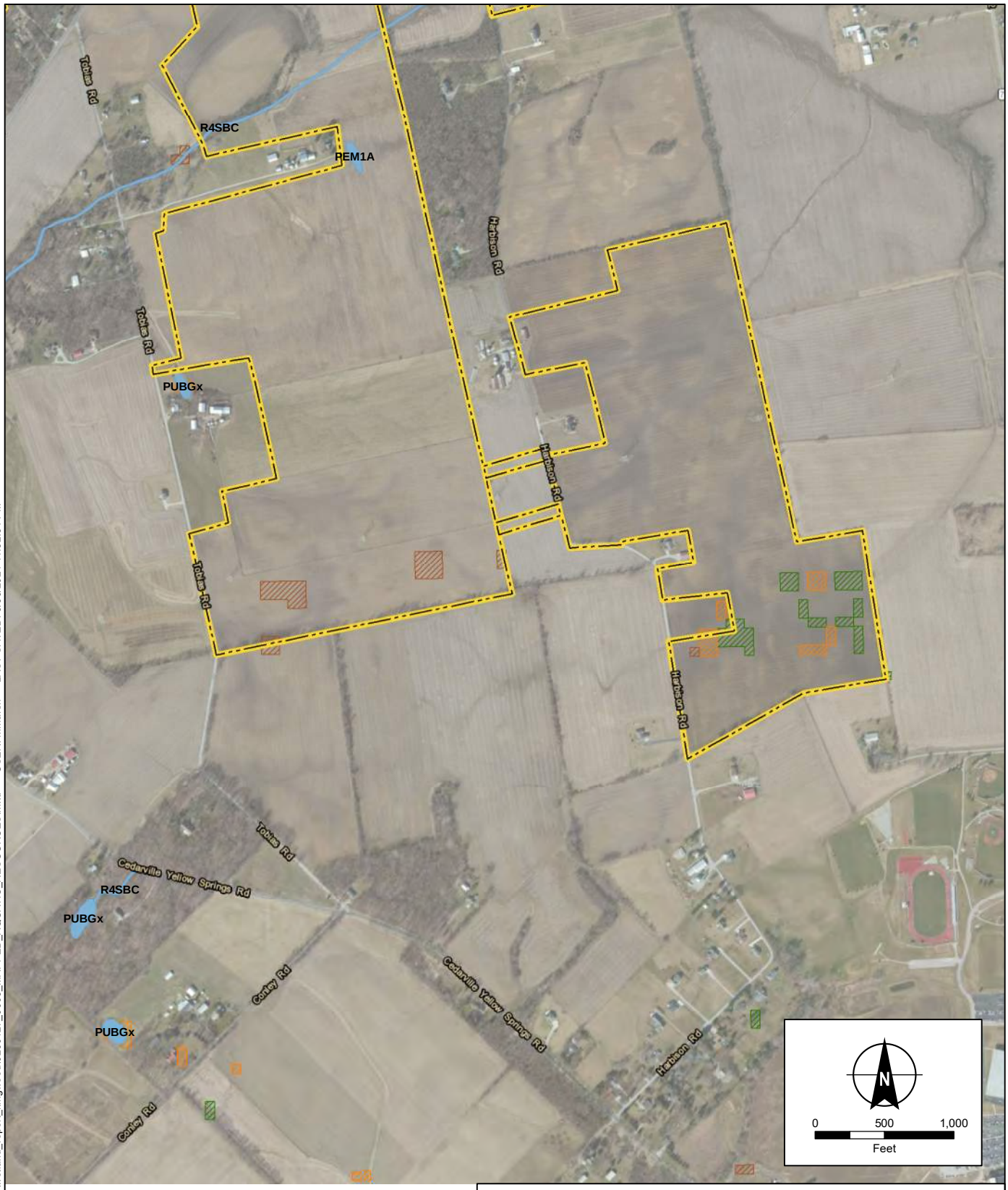


OHIO WETLANDS

- OPEN WATER
- WET MEADOW
- SHALLOW MARSH
- SCRUB/SHRUB WETLAND
- WOODS ON HYDRIC SOIL

- NWI MAPPED WETLAND
- STUDY AREA

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. OHIO WETLANDS INVENTORY SOURCE: ODNR
3. NWI WETLAND SOURCE: USFWS

HALEY ALDRICH

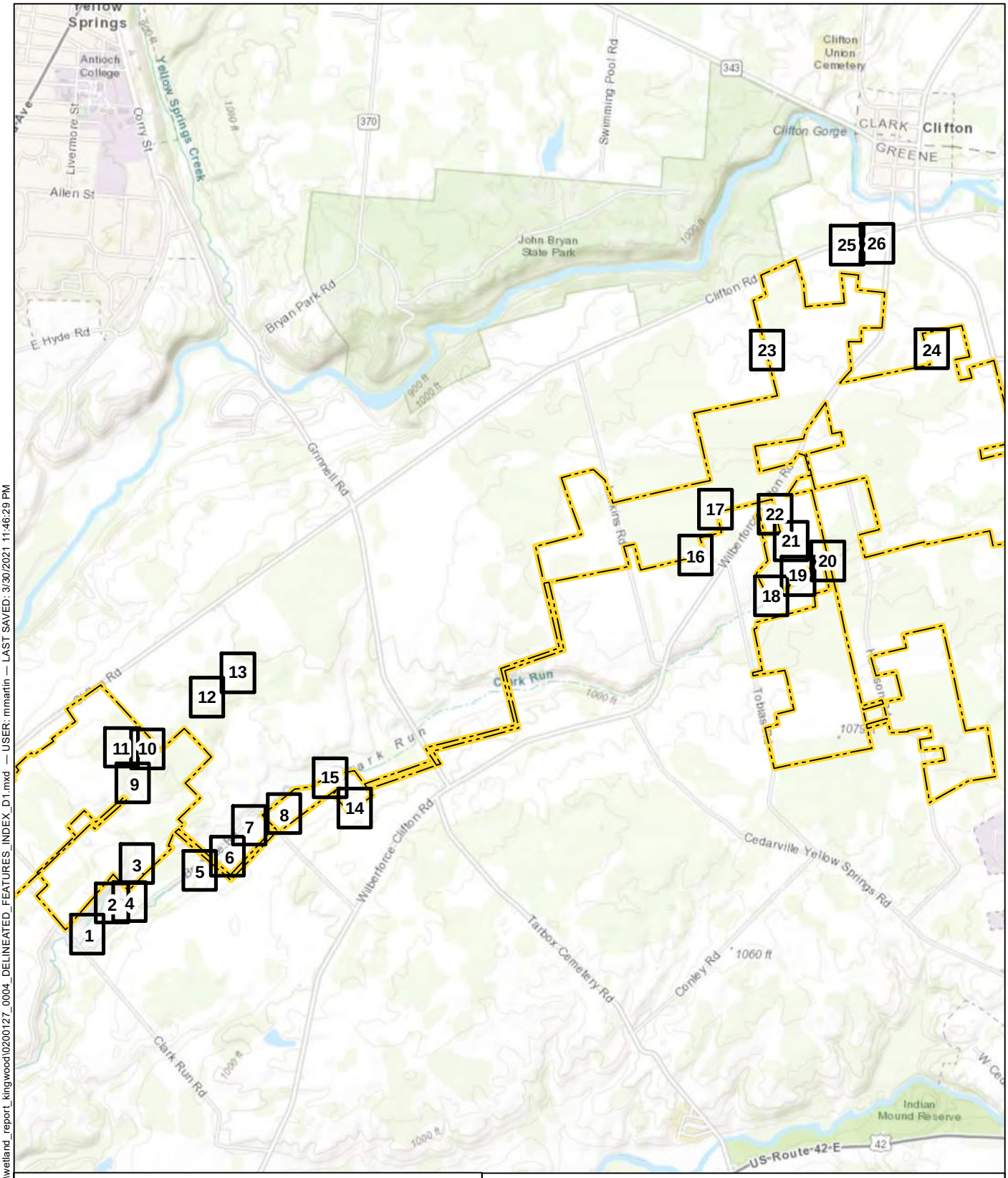
KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

FEDERAL AND STATE
MAPPED AQUATIC RESOURCES

SCALE: AS SHOWN
MARCH 2021

FIGURE 3
SHEET 6 OF 6

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0003_MAPPED_AQUATIC_RESOURCES.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:32:54 PM



INDEX SHEET

STUDY AREA

N

0 0.25 0.5

Miles

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DELINEATED WETLAND TYPES ARE BASED ON COWARDIN CLASSIFICATION.
3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
INDEX SHEET

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_INDEX_D1.mxd — USER: mmartin — LAST SAVED: 3/30/2021 11:46:29 PM

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DELINEATED WETLAND TYPES ARE BASED ON COWARDIN CLASSIFICATION.
3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 1 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DELINEATED WETLAND TYPES ARE BASED ON COWARDIN CLASSIFICATION.
3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

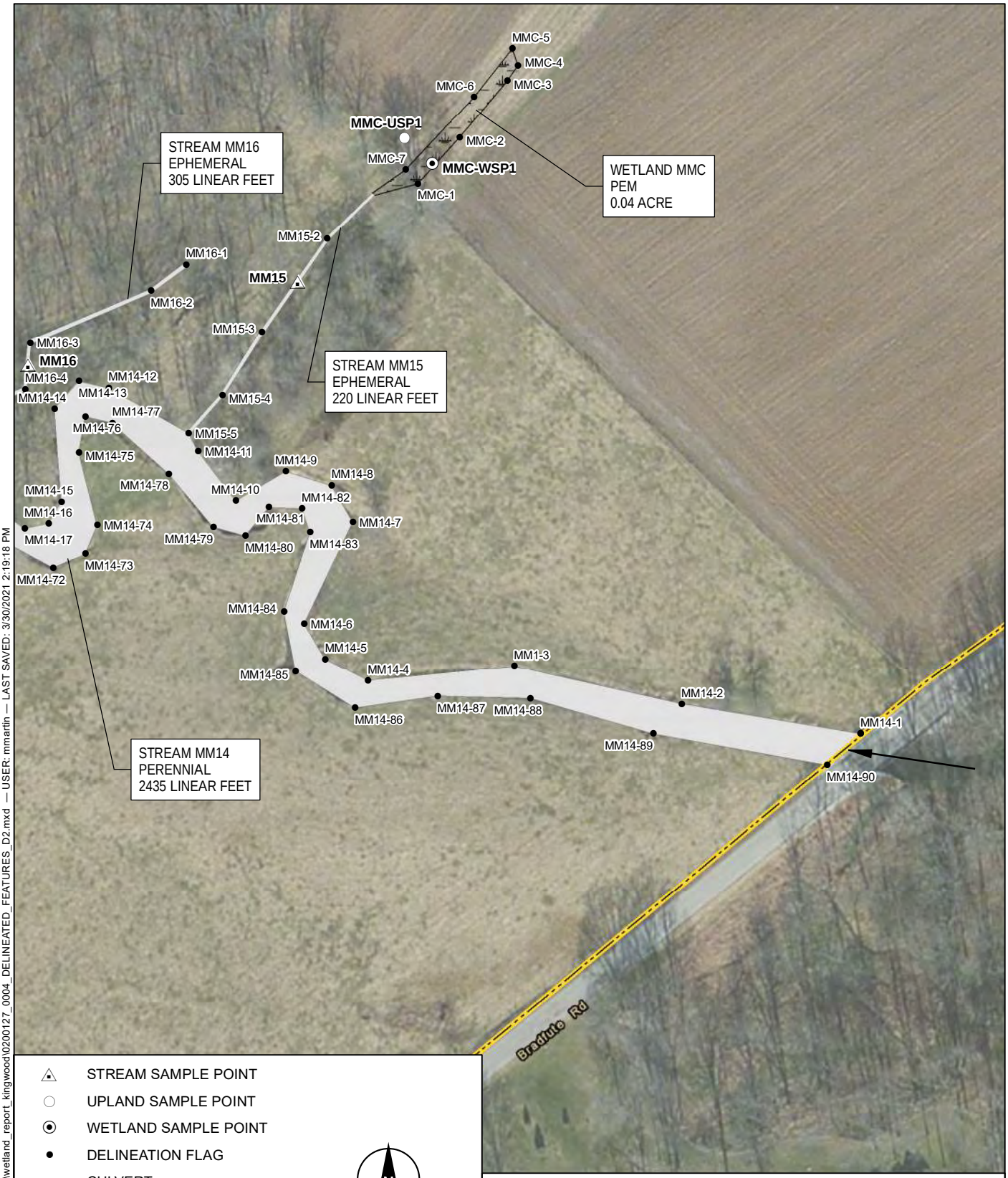
KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 2 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DELINEATED WETLAND TYPES ARE BASED ON COWARDIN CLASSIFICATION.
3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

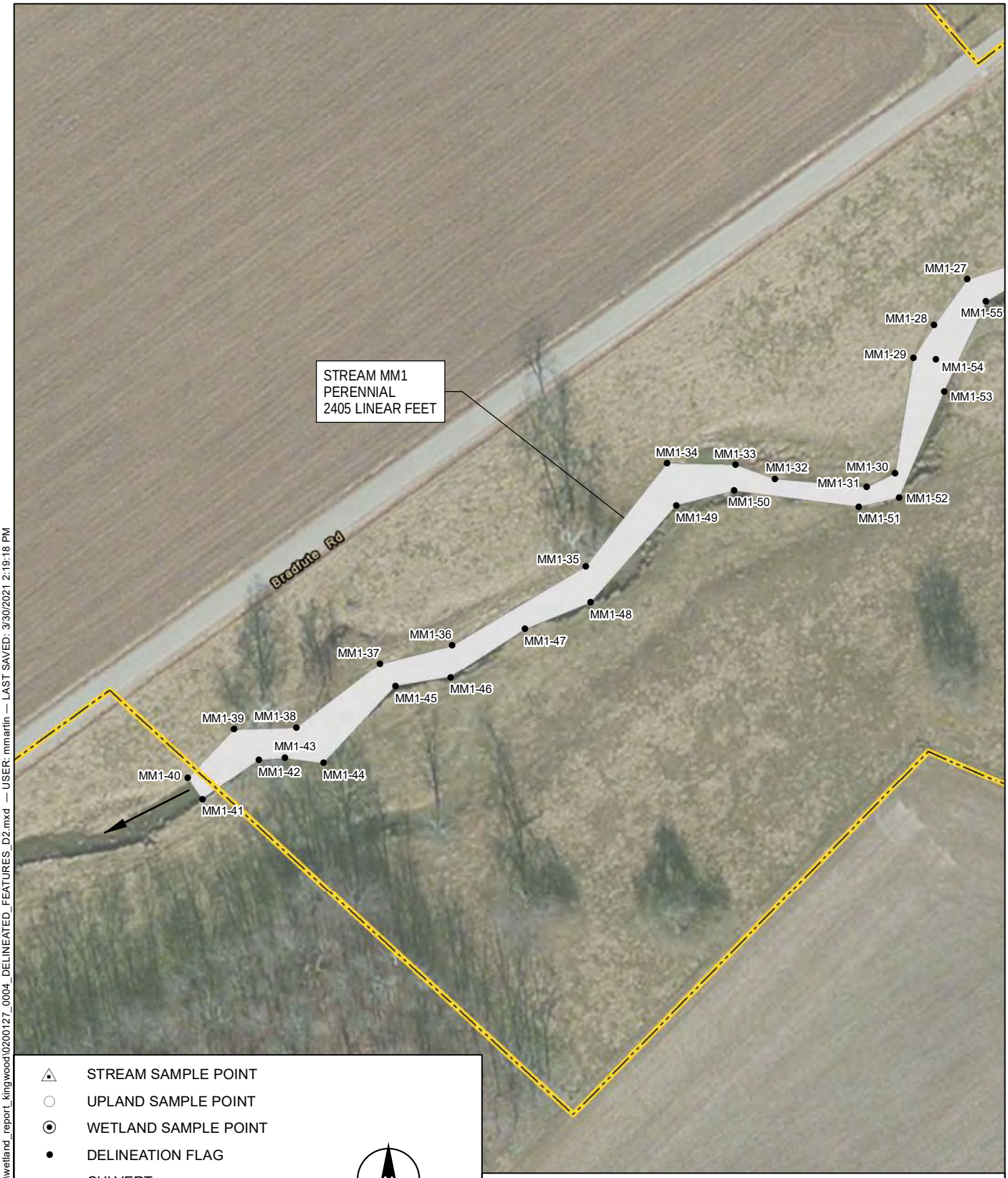
KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 3 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

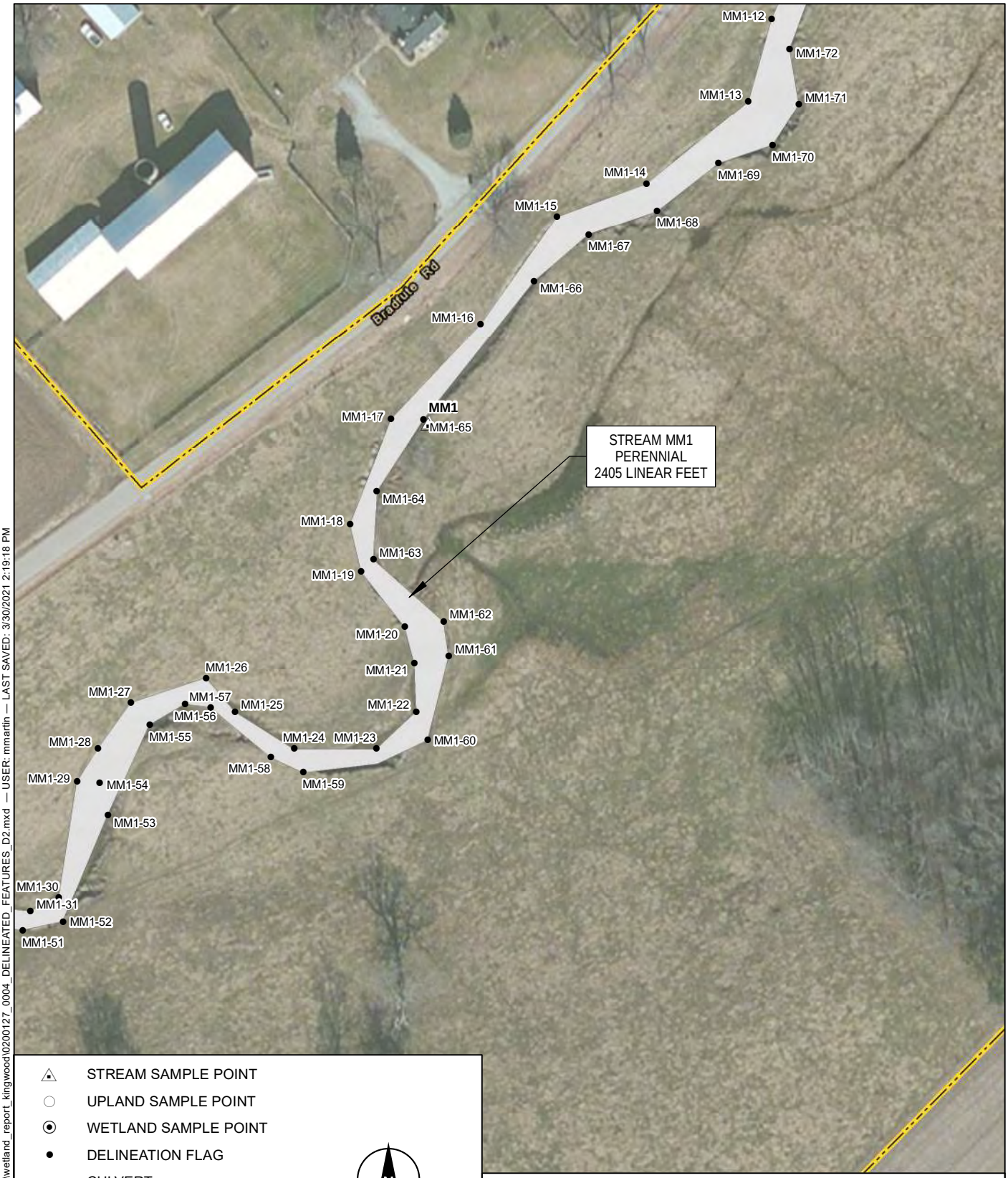
KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 4 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DELINEATED WETLAND TYPES ARE BASED ON COWARDIN CLASSIFICATION.
3. BASE MAP SOURCE: ESRI

HALEY ALDRICH

KINGWOOD SOLAR I LLC
KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 5 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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DELINEATED WETLANDS AND STREAMS

SCALE: AS SHOWN
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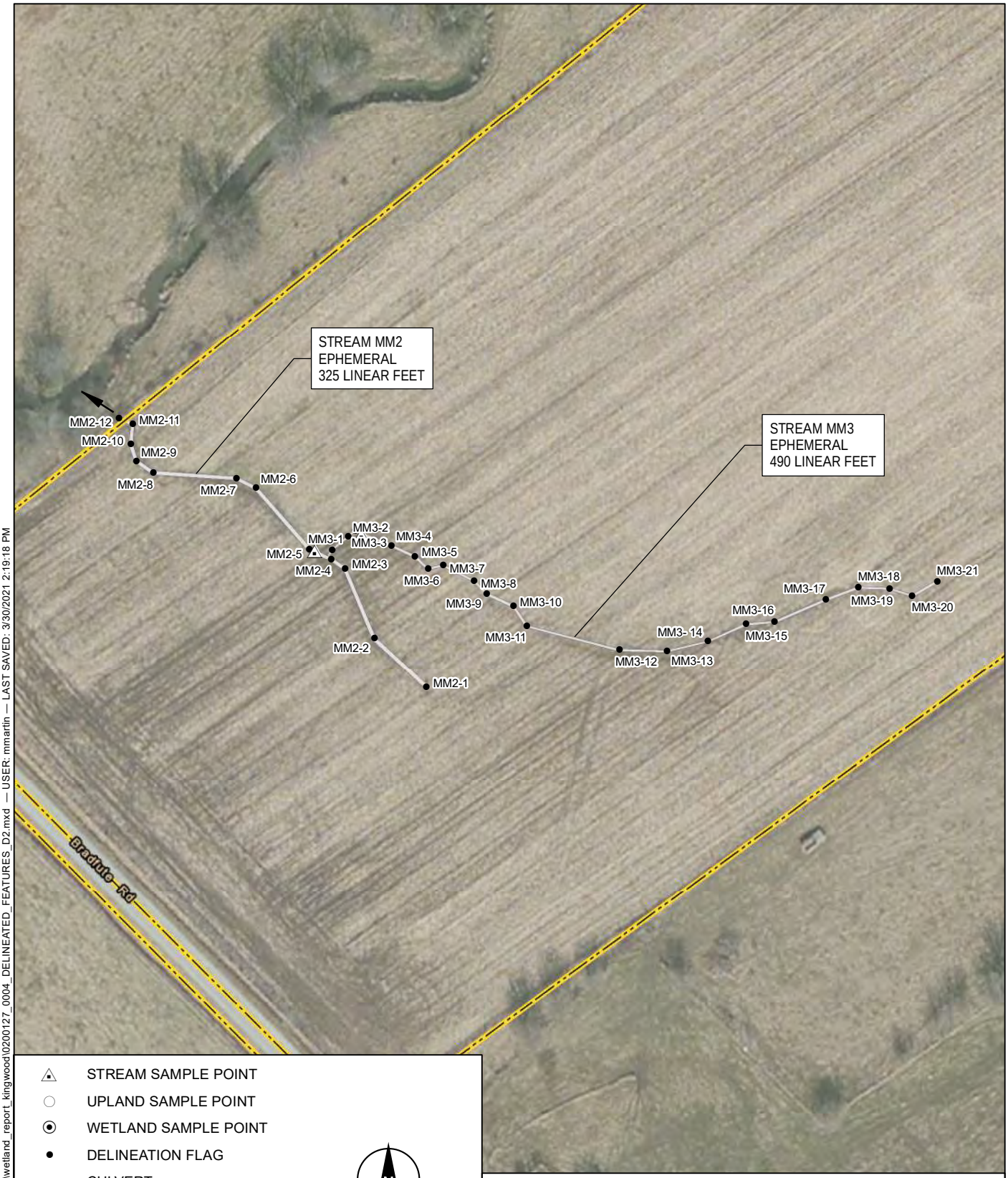
FIGURE 4
SHEET 6 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
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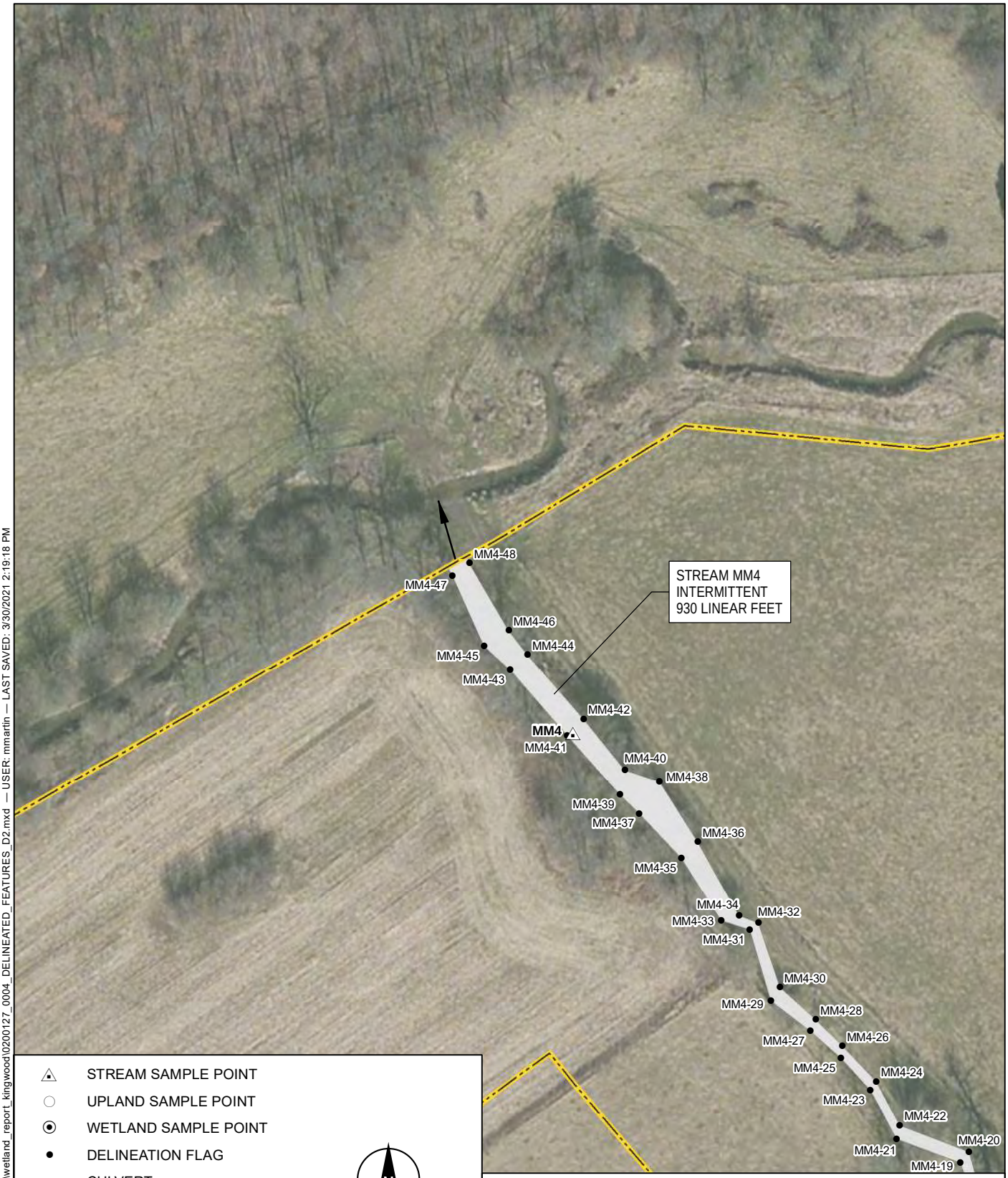
FIGURE 4
SHEET 7 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
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FIGURE 4
SHEET 8 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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HALEY ALDRICH

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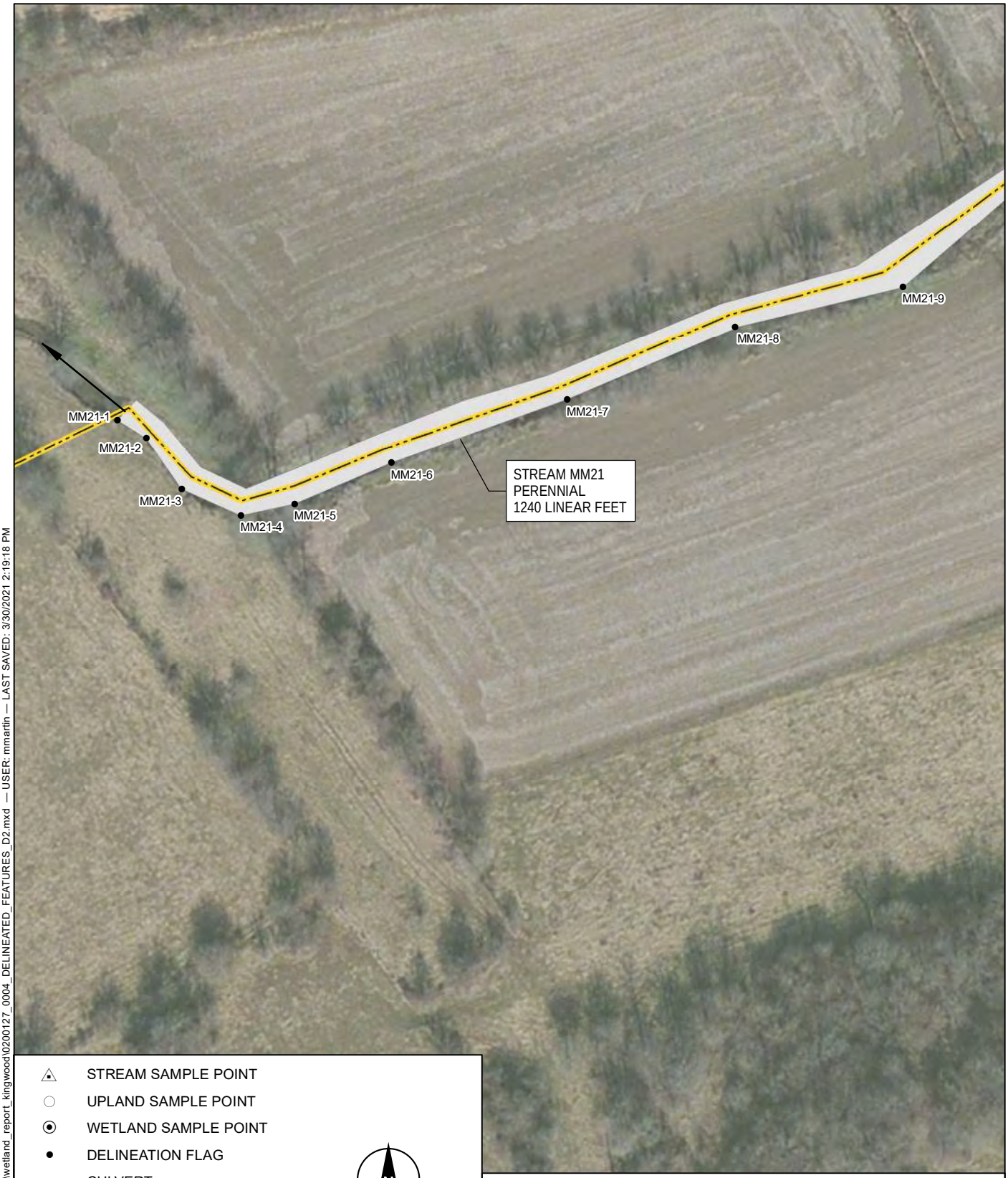
GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 9 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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GREENE COUNTY, OHIO

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AND STREAMS

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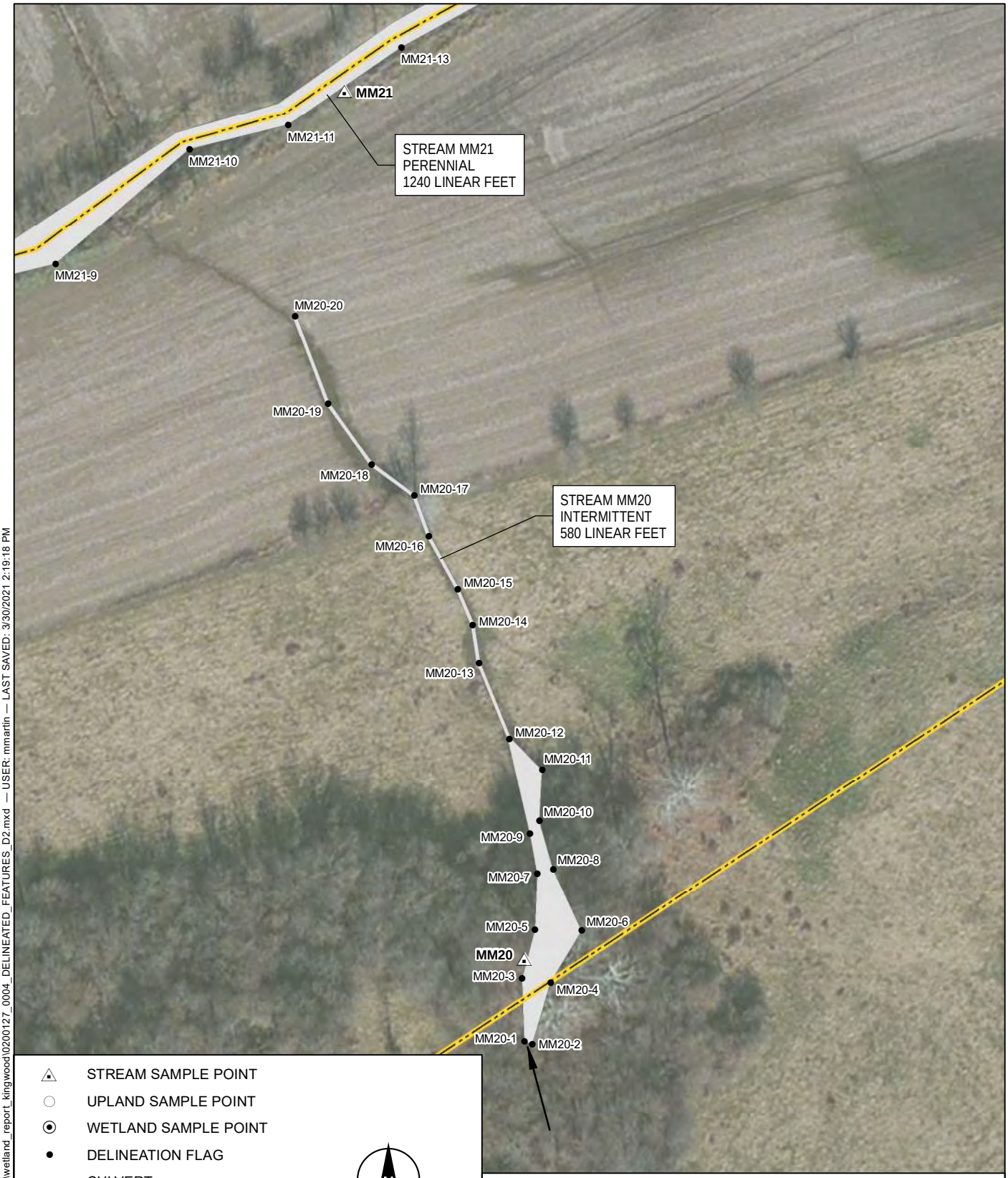
FIGURE 4
SHEET 10 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

DELINEATED WETLANDS AND STREAMS

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FIGURE 4
SHEET 11 OF 28

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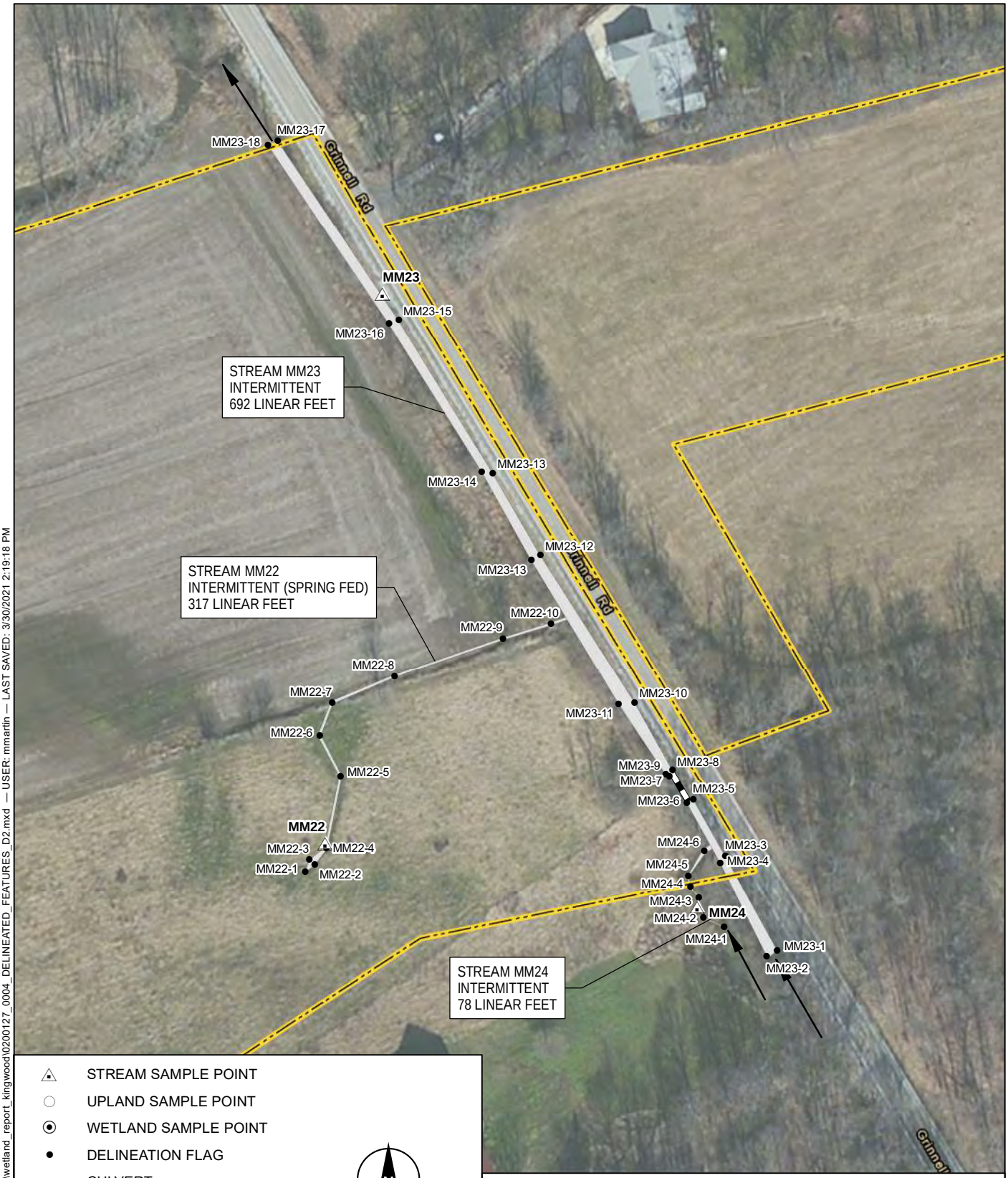

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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FIGURE 4
SHEET 12 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

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SCALE: AS SHOWN
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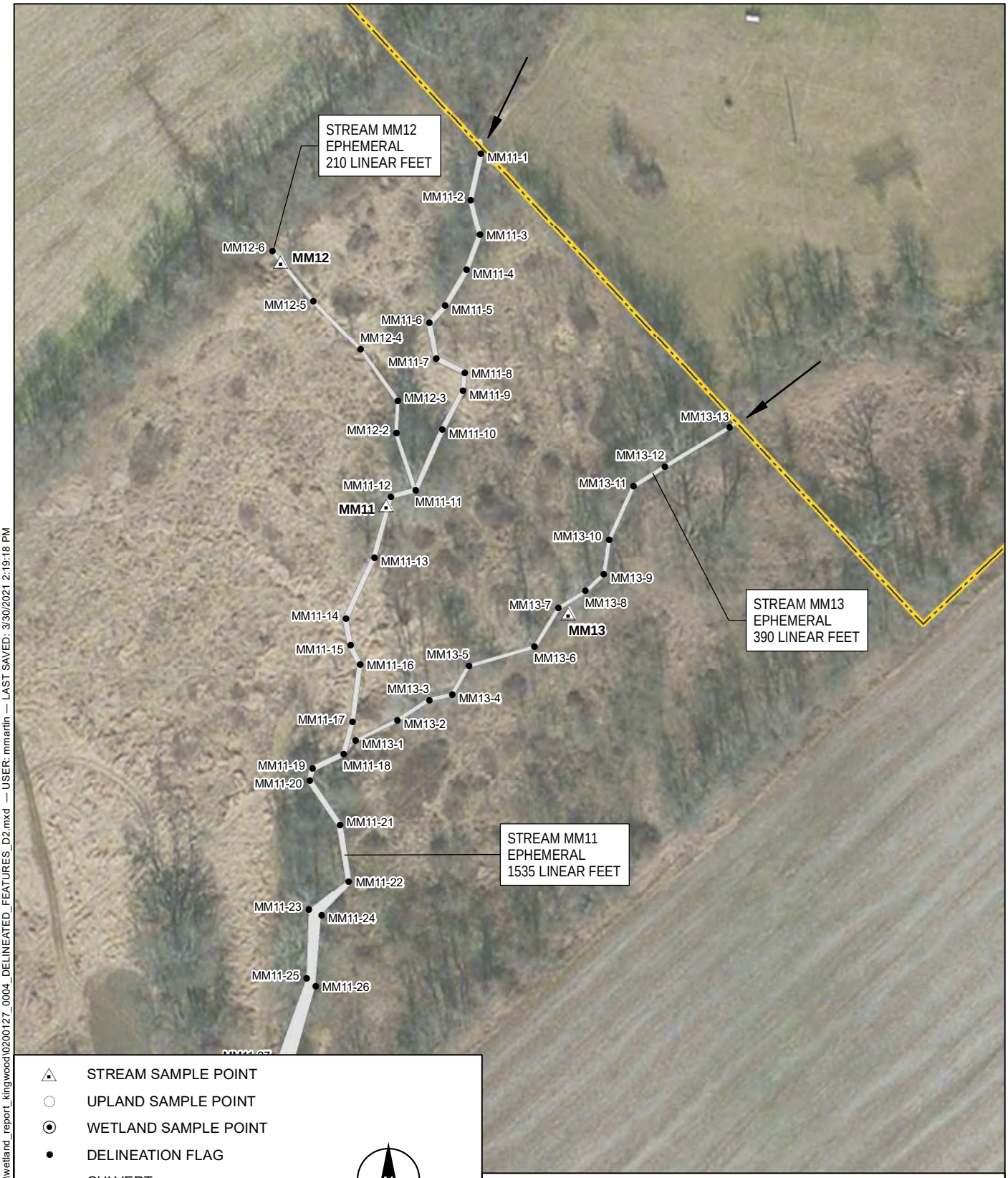
FIGURE 4
SHEET 13 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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FIGURE 4
SHEET 14 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

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AND STREAMS

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FIGURE 4
SHEET 15 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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AND STREAMS

SCALE: AS SHOWN
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FIGURE 4
SHEET 16 OF 28

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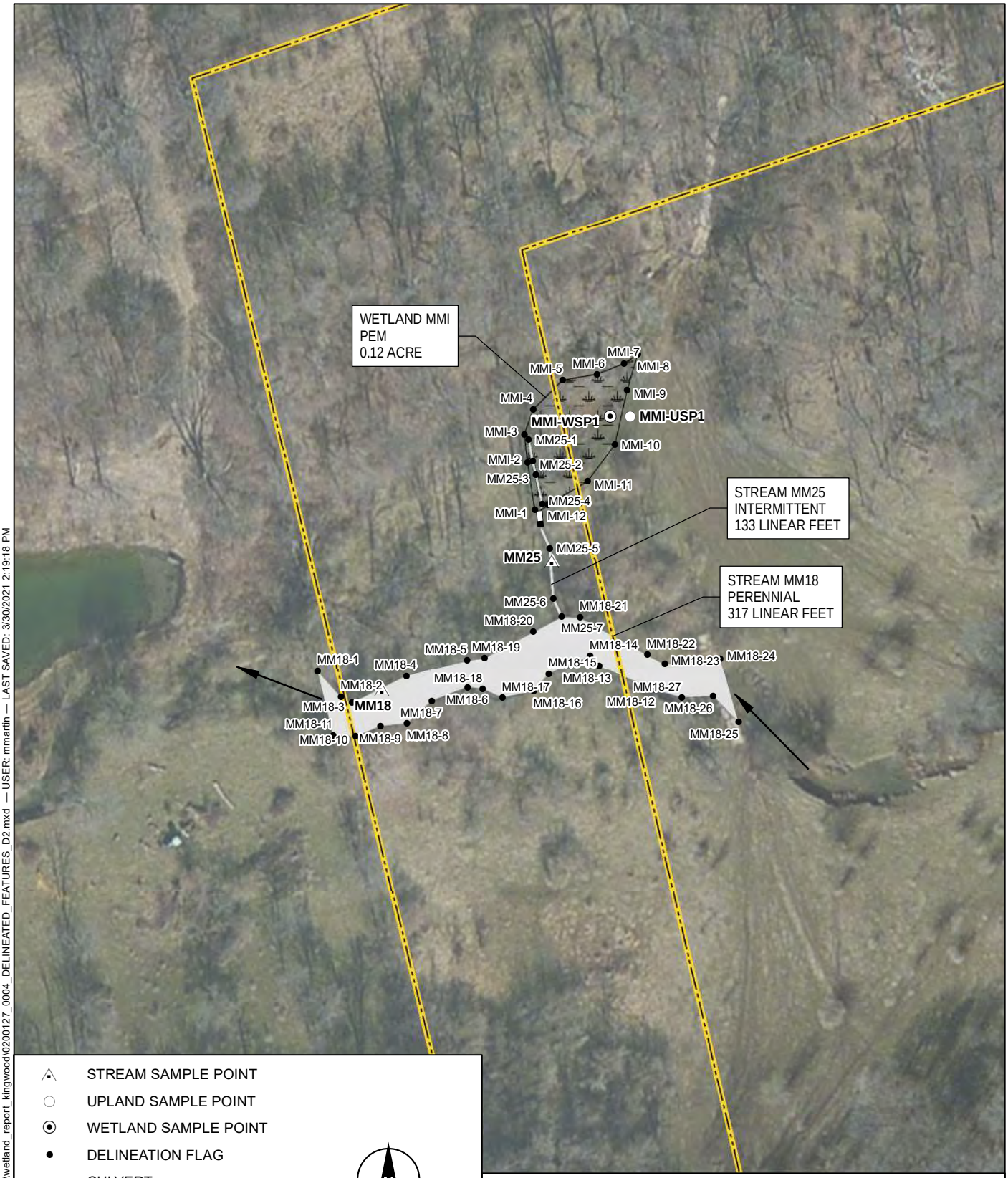

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
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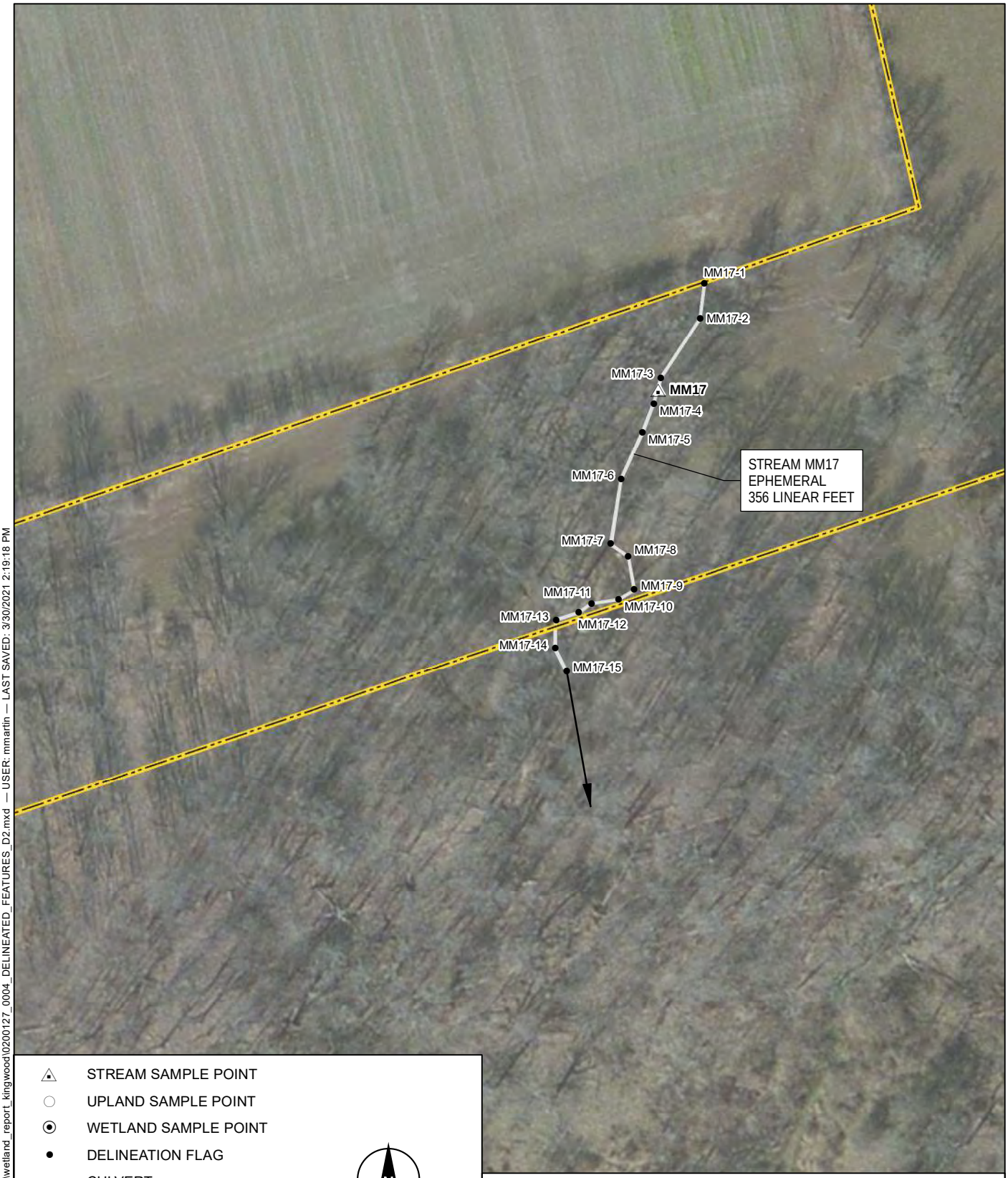
FIGURE 4
SHEET 17 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

DELINEATED WETLANDS
AND STREAMS

SCALE: AS SHOWN
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FIGURE 4
SHEET 18 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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SCALE: AS SHOWN
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FIGURE 4
SHEET 19 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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AND STREAMS

SCALE: AS SHOWN
MARCH 2021

FIGURE 4
SHEET 20 OF 28

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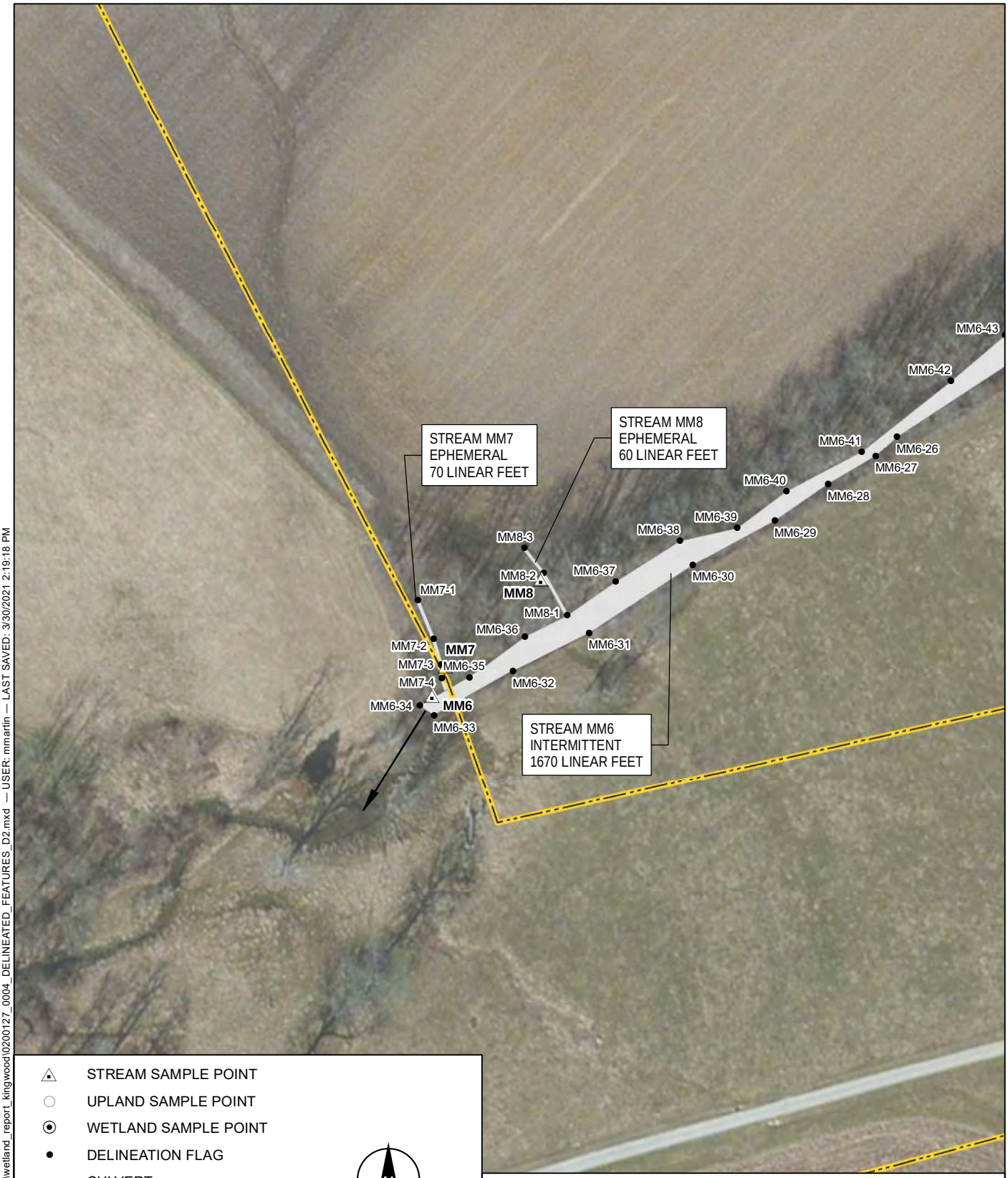

STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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FIGURE 4
SHEET 21 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

N

0 50 100
Feet

NOTES
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GREENE COUNTY, OHIO

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AND STREAMS

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FIGURE 4
SHEET 22 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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AND STREAMS

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FIGURE 4
SHEET 23 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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FIGURE 4
SHEET 24 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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AND STREAMS

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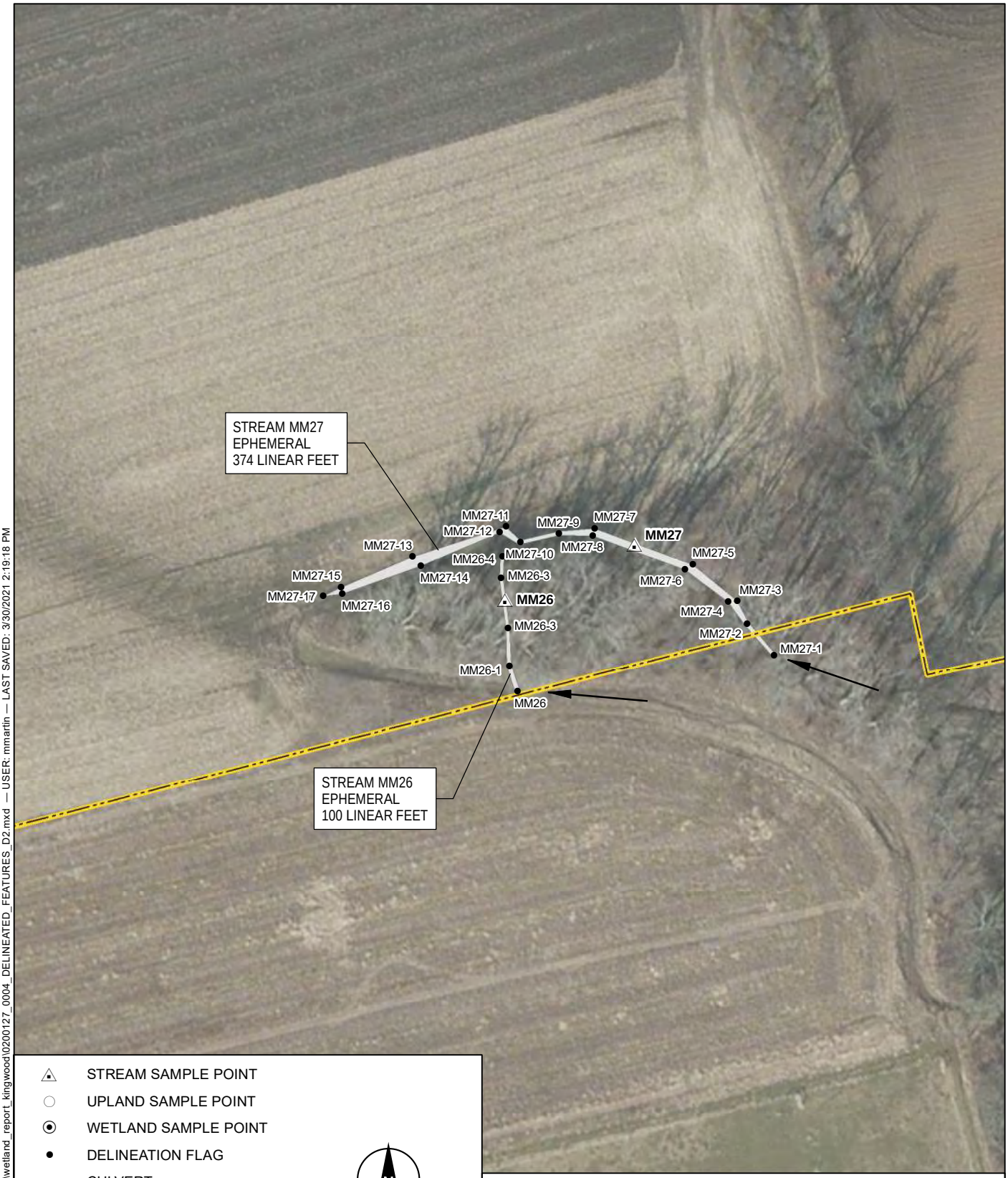
FIGURE 4
SHEET 25 OF 28

GIS FILE PATH: C:\Users\mmartin\Desktop\wetland_report_kingwood\0200127_0004_DELINEATED_FEATURES_D2.mxd — USER: mmartin — LAST SAVED: 3/30/2021 2:19:18 PM



STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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FIGURE 4
SHEET 26 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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3. BASE MAP SOURCE: ESRI

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GREENE COUNTY, OHIO

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AND STREAMS

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FIGURE 4
SHEET 27 OF 28

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STREAM SAMPLE POINT
UPLAND SAMPLE POINT
WETLAND SAMPLE POINT
DELINEATION FLAG
CULVERT
FEATURE CONTINUES
STUDY AREA
DELINEATED STREAM
DELINEATED WETLAND

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Feet

NOTES
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FIGURE 4
SHEET 28 OF 28

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APPENDIX A

Photo Log

Photo 1: View looking northeast within Wetland MMC (PEM) near sample point MMC-WSP1.

Photo 2: View looking southwest within Wetland MMC (PEM) near sample point MMC-WSP1.

Photo 3: View looking northeast within Wetland MMD (PEM) near flag MMD-4.

Photo 4: View looking southwest within Wetland MMD (PEM) near sample point MMD-WSP1.

Photo 5: View looking southwest within Wetland MME (PFO) near sample point MME-WSP1.

Photo 6: View looking east within Wetland MME (PFO) near sample point MME-WSP1.

Photo 7: View looking east within Wetland MMG (PEM) near flag MMG-2.

Photo 8: View looking north within Wetland MMG (PEM) near sample point MMG-WSP1.

Photo 9: View looking southeast within Wetland MMH (PEM) near flag MMH-1.

Photo 10: View looking north within Wetland MMH (PEM) near sample point MMH-WSP1.

Photo 11: View looking northeast within Wetland MMI (PEM) near flag MMI-2.

Photo 12: View looking west within Wetland MMI (PEM) near sample point MMI-WSP1.

Photo 13: View looking east (upstream) at Stream MM1 (Perennial) near flag MM1-35.

Photo 14: View looking west (downstream) at Stream MM1 (Perennial) near flag MM1-35.

Photo 15: View looking east (upstream) at Stream MM2 (Ephemeral) near flag MM2-5.

Photo 16: View looking west (downstream) at Stream MM2 (Ephemeral) near flag MM2-1.

Photo 17: View looking east (upstream) at Stream MM3 (Ephemeral) near flag MM3-13.

Photo 18: View looking west (downstream) at Stream MM3 (Ephemeral) near flag MM3-13.

Photo 19: View looking southeast (upstream) at Stream MM4 (Intermittent) near flag MM4-23.

Photo 20: View looking northwest (downstream) at Stream MM4 (Intermittent) near flag MM4-23.

Photo 21: View looking south (upstream) at Stream MM5 (Intermittent) near flag MM5-22.

Photo 22: View looking north (downstream) at Stream MM5 (Intermittent) near flag MM5-22.

Photo 23: View looking east (upstream) at Stream MM6 (Intermittent) near flag MM6-25.

Photo 24: View looking west (downstream) at Stream MM6 (Intermittent) near flag MM6-25.

Photo 25: View looking northwest (upstream) at Stream MM7 (Ephemeral) near flag MM7-3.

Photo 26: View looking south (downstream) at Stream MM7 (Ephemeral) near flag MM1-1.

Photo 27: View looking northwest (upstream) at Stream MM8 (Ephemeral) near flag MM8-1.

Photo 28: View looking southeast (downstream) at Stream MM8 (Ephemeral) near flag MM8-3.

Photo 29: View looking northwest (upstream) at Stream MM9 (Ephemeral) near flag MM9-5.

Photo 30: View looking southeast (downstream) at Stream MM9 (Ephemeral) near flag MM9-5.

Photo 31: View looking northwest (upstream) at Stream MM10 (Ephemeral) near flag MM10-6.

Photo 32: View looking southeast (downstream) at Stream MM10 (Ephemeral) near flag MM10-6.

Photo 33: View looking northeast (upstream) at Stream MM11 (Ephemeral) near flag MM11-10.

Photo 34: View looking south (downstream) at Stream MM11 (Ephemeral) near flag MM11-10.

Photo 35: View looking northwest (upstream) at Stream MM12 (Ephemeral) near flag MM12-3.

Photo 36: View looking southeast (downstream) at Stream MM12 (Ephemeral) near flag MM12-3.

Photo 37: View looking northeast (upstream) at Stream MM13 (Ephemeral) near flag MM13-13.

Photo 38: View looking southwest (downstream) at Stream MM13 (Ephemeral) near flag MM13-13.

Photo 39: View looking southest (downstream) at Stream MM14 (Perennial) near flag (at intersection with MM15).

Photo 40: View looking northwest (upstream) at Stream MM14 (Perennial) near flag (at intersection with MM15).

Photo 41: View looking northeast (upstream) at Stream MM15 (Ephemeral) near flag MM15-5.

Photo 42: View looking southwest (downstream) at Stream MM15 (Ephemeral) near flag MM15-2.

Photo 43: View looking northeast (upstream) at Stream MM16 (Ephemeral) near flag MM16-2.

Photo 54: View looking northwest (downstream) at Stream MM16 (Ephemeral) near flag MM16-7.

Photo 55 View looking northeast (upstream) at Stream MM17 (Ephemeral) near flag MM17-3.

Photo 56: View looking southwest (downstream) at Stream MM17 (Ephemeral) near flag MM17-3.

Photo 55 View looking northwest (upstream) at Stream MM18 (Perennial) near flag MM18-7.

Photo 56: View looking west (downstream) at Stream MM18 (Perennial) near flag MM18-7.

Photo 55 View looking east (upstream) at Stream MM19 (Intermittent) near flag MM19-3.

Photo 56: View looking west (downstream) at Stream MM19 (Intermittent) near flag MM19-3.

Photo 55 View looking south (upstream) at Stream MM20 (Intermittent) near flag MM20-3.

Photo 56: View looking north (downstream) at Stream MM20 (Intermittent) near flag MM20-3.

Photo 55 View looking northeast (upstream) at Stream MM21 (Perennial) near flag MM21-14.

Photo 56: View looking west (downstream) at Stream MM21 (Perennial) near flag MM21-14.

Photo 55 View looking south (upstream) at Stream MM22 (Intermittent) near flag MM22-5.

Photo 56: View looking east (upstream) at Stream MM22 (Intermittent) near flag MM22-9.

Photo 55 View looking southeast (upstream) at Stream MM23 (Intermittent) near flag MM23-5.

Photo 56: View looking northwest (downstream) at Stream MM23 (Intermittent) near flag MM23-7.

Photo 55 View looking southeast (upstream) at Stream MM24 (Intermittent) near flag MM24-3.

Photo 56: View looking northwest (upstream) at Stream MM24 (Intermittent) near flag MM24-3.

Photo 55 View looking south (downstream) at Stream MM25 (Intermittent) near flag MM25-5.

Photo 56: View looking north (upstream) at Stream MM25 (Intermittent) near flag MM25-6.

Photo 55 View looking south (upstream) at Stream MM26 (Ephemeral) near flag MM26-3.

Photo 56: View looking north (downstream) at Stream MM26 (Ephemeral) near flag MM26-3.

Photo 55 View looking southeast (upstream) at Stream MM27 (Ephemeral) near flag MM27-2.

Photo 56: View looking northwest (downstream) at Stream MM27 (Ephemeral) near flag MM27-4.

APPENDIX B

Description of Delineated Wetlands and Streams

HALEY ALDRICH

Wetland MMC is a 0.73-acre PEM wetland. The observed indicators of wetland hydrology included Drainage Patterns (B10), Geomorphic Position (D2), FAC-Neutral Test (D5). The dominant vegetation included reed canary grass and pink smartweed (*Persicaria pensylvanica*). The observed hydric soil indicators were Depleted Below Dark Surface (A11), Depleted Matrix (F3), Redox Dark Surface (F6).

Wetland MMD is a 0.13-acre PEM wetland. The observed indicators of wetland hydrology were Oxidized Rhizospheres on Living Roots (C3). The dominant vegetation included eastern cottonwood (*Populus deltoides*), black willow, honey locust, southern arrowwood (*Viburnum dentatum*), green ash, silver maple, calico aster, and shoreline sedge. The observed hydric soil indicator was Depleted Matrix (F3).

Wetland MME is a 0.88-acre PFO wetland. The observed indicators of wetland hydrology were Water-Stained Leaves (B9) and Oxidized Rhizospheres on Living Roots (C3). The dominant vegetation included black willow, eastern cottonwood, green ash, southern arrowwood, slippery elm (*Ulmus rubra*), poison ivy (*Toxicodendron radicans*), and raspberry (*Rubus idaeus*). The observed hydric soil indicator was Depleted Matrix (F3).

Wetland MMG is a 0.29-acre PEM wetland. The observed indicators of wetland hydrology included Saturation (A3) and Oxidized Rhizospheres on Living Roots (C3). The dominant vegetation included green ash, Amur honeysuckle, and lake sedge (*Carex lacustris*). The observed hydric soil indicator was Depleted Matrix (F3).

Wetland MMH is a 0.06-acre PEM wetland. The observed indicators of wetland hydrology were Drainage Patterns (B10) and Geomorphic Position (D2). The dominant vegetation included pink smartweed, common boneset (*Eupatorium perfoliatum*), and fall panicum (*Panicum dichotomiflorum*). The observed hydric soil was Redox Dark Surface (F6).

Wetland MMI is a 0.12-acre PEM wetland. The observed indicators of wetland hydrology were Surface Water (A1), Algal Mat or Crust (B4), and Water-Stained Leaves (B9). The dominant vegetation included cursed crowfoot (*Ranunculus sceleratus*), common boneset, and spotted touch-me-not (*Impatiens capensis*). The observed hydric soil indicator was Depleted Matrix (F3). This wetland has been heavily impacted from use as cow pasture.

Stream MM1 (Clark Run) is a perennial stream that flows west through a livestock pasture. The stream was approximately 7 feet wide and had a cobble, boulder, and silt substrate. The water was turbid and approximately 8 inches deep at the time of observation.

Stream MM2 is an ephemeral drainage channel within a soybean field that was not flowing at the time of observation. The stream width was approximately 3 feet and the channel substrate was silt and cobble.

Stream MM3 is an ephemeral drainage channel within a soybean field that was not flowing at the time of observation. The stream width was approximately 2 feet and the channel substrate was silt.

Stream MM4 is an intermittent stream within pasture and soybean fields that was not flowing at the time of observation. The stream width was approximately 6 feet and the channel substrate was cobble, boulder, and silt.

Stream MM5 is an intermittent stream within a soybean field that was not flowing at the time of observation. The stream width was approximately 3 feet and the channel substrate was silt, cobble, and boulder.

Stream MM6 is an intermittent stream that flows southwest though areas of pasture and forest. The stream was approximately 5 feet wide and had a silt and cobble substrate. The water was turbid and approximately 5 inches deep at the time of observation.

Stream MM7 is an ephemeral drainage channel within corn field and forest areas that flows southeast. The stream width was approximately 3 feet and the channel substrate was silt. The water was slightly turbid and approximately 2 inches deep at the time of observation.

Stream MM8 is an ephemeral drainage channel within a forested area that flows south. The stream width was approximately 3 feet and the channel substrate was silt. The water was turbid and approximately 2 inches deep at the time of observation.

Stream MM9 is an ephemeral drainage channel that flows south through areas of corn, soybean, and scrub shrub. The stream width was approximately 2 feet and the channel substrate was silt. The water was slightly turbid and approximately 2 inches deep at the time of observation.

Stream MM10 is an ephemeral drainage channel within a forested area that was not flowing at the time of observation. The stream width was approximately 4 feet and the channel substate was cobble and silt.

Stream MM11 is an ephemeral drainage channel within forest and scrub/shrub areas that was not flowing at the time of observation. The stream width was approximately 3 feet and the channel substrate was cobble, silt, and clay.

Stream MM12 is an ephemeral drainage channel within a scrub shrub area that was not flowing at the time of observation. The steam width was approximately 2 feet and the channel substrate was cobble and silt.

Stream MM13 is an ephemeral drainage channel within areas of forest and scrub shrub that was not flowing at the time of observation. The stream width was approximately 3 feet and the channel substrate was cobble, silt, and clay.

Stream MM14 (Clark Run) is a perennial stream that flows southwest through areas of pasture and woodland. The stream width was approximately 10 feet and the channel substrate was silt and cobble. The waster was turbid and approximately 2 feet deep.

Stream MM15 is an ephemeral drainage channel within a forested area that was not flowing at the time of observation. The stream width was approximately 2 feet and the channel substrate was cobble and silt.

Stream MM16 is an ephemeral drainage channel within areas of pasture and forest that was not flowing at the time of observation. The stream width was approximately 2 feet and the channel substrate was silt and clay.

Stream MM17 is an ephemeral drainage channel within areas of pasture and forest that was not flowing at the time of observation. The stream width was approximately 2 feet and the channel substrate was silt, clay and cobble.

Stream MM18 is a perennial stream (Clark run) that flows west through a cow pasture. The stream width was approximately 20 feet and the substrate was primarily cobble, gravel, silt and sand. The water was slightly turbid and approximately 1 foot deep at the time of observation.

Stream MM19 is an intermittent stream that flows west through a cow pasture. The stream width was approximately 10 feet and the substrate was primarily bedrock, cobble and silt. There was no flow at the time of observation though pools were still holding several inches of water.

Stream MM20 is an intermittent stream that flows north through a scrub shrub area into an agricultural field. There appears to be remnants of an old stacked stone dam on part of the stream. The stream appears to dissipate as it flows through the agricultural field and no channel could be observed that connects to Clark Run, though aerial imagery indicates flow likely reaches Clark Run during high water events. The stream width was approximately 10 feet in the southern portion and the substrate was primarily cobble. Approximately 1 inch of slightly turbid water was flowing in the southern portion at the time of observation.

Stream MM21 is a perennial stream (Clark Run) that flows west through an agricultural field. The stream width was approximately 20 feet and the substrate was primarily cobble, silt and sand. The water was clear and approximately 8 inches deep at the time of observation.

Stream MM22 is an intermittent stream that originates from a stream at the base of a small hill. The stream width was approximately 2 feet and the substrate was primarily silt and sand. The water was clear and approximately 3 inches deep at the time of observation. Stream flow dissipated before reaching a swale that proceeds east to Stream MM23.

Stream MM23 is an intermittent stream that has been channelized along the shoulder of Grinnell Road. The stream width was approximately 10 feet and the substrate was primarily cobbles. The water was clear and approximately 2 inches deep at the time of observation. The stream flows northwest into Clark Run just north of the Study Area.

Stream MM24 is an intermittent stream that flows north into Stream MM23. The stream width was approximately 1 foot and the substrate was primarily sand and silt. The water was clear and approximately 1 inch deep at the time of observation.

Stream MM25 is an intermittent stream that flows south out of Wetland MMI through a cow pasture into Clark Run (Stream MM18). The stream width was approximately 2 feet and the substrate was primarily silt and cobble. The water was clear and approximately 1 inch deep at the time of observation.

Stream MM26 is an ephemeral drainage channel that flows north into an agricultural drainage system. The natural hydrology of the area appears to be heavily impacted by drainage installed in the adjacent agricultural fields. The stream width was approximately 3 feet and the substrate was primarily silt and cobble. The water was clear and approximately 2 inches deep at the time of observation.

Stream MM27 is an ephemeral drainage channel that flows west along the edge of agricultural field and was dry at the time of observation. This stream appears to be impacted by the same drainage system described above for MM26. The stream width was approximately 6 feet and the substrate was primarily silt and silt loam.

APPENDIX C

Wetland Determination Data and Stream Inventory Data Forms

HALEY ALDRICH

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: KINGWOOD SOLAR City/County: Greene Sampling Date: 10/16/21

Applicant/Owner: Lend Lease State: OH Sampling Point: MME-USP1

Investigator(s): K. LODGE + M. MARTIN Section, Township, Range: _____

Landform (hillslope, terrace, etc.): FLAT Local relief (concave, convex, none): NONE

Slope (%): 0 Lat: 39.77234623 Long: -83.84195353 Datum: WGS 84

Soil Map Unit Name: FINDASTLE SILT LOAM, SOUTHERN OH TILL PLAIN, 0-2% SLOPES NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
DROUGHT CONDITIONS

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Herb Stratum (Plot size: ____)			
1. CULTIVATED SOYBEAN (Glycine max)	30	Y	UPL
2. INDIAN TOBACCO (Lobelia inflata)	30	Y	FACU
3. GOLDENROD (Solidago altissima)	10	N	FACU
4. RASPBERRY (Rubus idaeus)	15	N	FACU
5. PANIC/ZIG-ZAG GRASS (Panicum dichotomiflorum)	10	N	FACU
6. FESCUE (Festuca sp.)	5	N	FACU
7.			
8.			
9.			
10.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: —)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes ____ No X

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

SOIL

Sampling Point: MME-USP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 5/3	90	2.5Y 5/6	10	C	M	SILT LOAM	
10-16	10YR 4/4	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Active soybean field

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Active soybean field

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: KINGWOOD SOLAR City/County: Greene Sampling Date: 10/19/21
Applicant/Owner: LendLease State: OH Sampling Point: MMG-WSP1
Investigator(s): K. LODGE + M. MARTIN Section, Township, Range: _____
Landform (hillslope, terrace, etc.): FLAT Local relief (concave, convex, none): NONE
Slope (%): 0 Lat: 39.77061274 Long: -83.83389499 Datum: WGS 84
Soil Map Unit Name: RAGSDALE SILTY CLAY LOAM 0-2% SLOPES NWI classification: PEM
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 _____, Soil _____, or Hydrology _____ naturally problematic? no (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 X	No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:
FLOOD PLAIN OF STREAM
RAINY CONDITIONS

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. GREEN ASH (Fraxinus pennsylvanica)	5	Y	FACW
2.			
3.			
4.			
5.			
	5 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. HONEYSUCKLE (Lonicera maackii)	5	Y	UPL
2.			
3.			
4.			
5.			
	5 = Total Cover		

Herb Stratum (Plot size: 5')			
1. JEWELWEED (Impatiens capensis)	10	N	FACW
2. LAKEBANK SEDGE, CAREX LACUSTRIS	40	Y	OBL
3. REED CANARYGRASS (Phalaris arundinacea)	10	N	FACW
4. CALICO ASTER (Symphyotrichum lateriflorum)	5	N	FACW
5. FOWL MANNA GRASS (Glyceria striata)	35	Y	OBL
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		

Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
May be mowed periodically.

Sampling Point: NMG-WSP1

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/1	90	10YR 4/6	10	C	M+PL	SILTY CLAY	
6-16	2.5Y 4/1	80	7.5YR 4/6	20	C	M+PL	SILTY CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0-16

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: KINGWOOD SOLAR City/County: GREENE Sampling Date: 10/19/20

Applicant/Owner: LendLease State: OH Sampling Point: MMG-USP1

Investigator(s): K. LODGE + M. MARTIN Section, Township, Range: _____

Landform (hillslope, terrace, etc.): FLAT Local relief (concave, convex, none): NONE

Slope (%): 0 Lat: 39.77064506 Long: -83.83405246 Datum: WGS 84

Soil Map Unit Name: Ra-Rogsdale silty clay loam, 0-2% slopes NWI classification: —

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? no Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (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 X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. HICKORY (Carya cordiformis)	25	Y	FACU
2. CHERRY (Prunus serotina)	5	N	FACU
3. OSAGE ORANGE (Maclura pomifera)	10	Y	FACU
4. HONEY LOCUST (Gleditsia triacanthos)	5	N	FACU
5.			
	45	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. HONEYSUCKLE (Lonicera maackii)	5	N	UPL
2. DOGWOOD-SILKY (Cornus amomum)	15	Y	FACW
3. HICKORY (Carya cordiformis)	5	N	FACU
4. ELM (Ulmus rubra)	5	N	FACW
5.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. HORSETAIL (Equisetum arvense)	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. WINTER CREEPER (Euonymus fortunei)	20	Y	UPL
2.			
	20	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes ____ No X

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

Sampling Point: MNG-USP1

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					SILTY CLAY LOAM	
2-18	10YR 3/2	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Kingwood Solar City/County: Greene Sampling Date: 10-20-20
State: OH Sampling Point: MMH-WSP1
Applicant/Owner: LendLease
Investigator(s): M. Martin, K. Lodge Section, Township, Range:
Landform (hillslope, terrace, etc.): drainage depression Local relief (concave, convex, none): concave
Slope (%): 3 Lat. 39.784484172 Long: -83.836133391 Datum: WGS84
Soil Map Unit Name: Ragsdale silty clay loam, 0-2% slopes NWI classification: PEM
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 ___, Soil ___, or Hydrology ___ naturally problematic? no (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 ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		

Sapling/Shrub Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		

Herb Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Smartweed (Persicaria pensylvanica)	40	Y	FACW
2. Boneset (Eupatorium perfoliatum)	20	Y	OBL
3. Fall panicum (Panicum dichotomiflorum)	20	Y	FACW
4. Rough cocklebur (Xanthium strumarium)	10	N	FAC
5. Unidentified grass	10	N	
6.			
7.			
8.			
9.			
10.	100	= Total Cover	

Woody Vine Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	___ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)
Appears to be maintained in low vegetation because of adjacent farming activities.

Sampling Point: WSP-MMH

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	90	7.5YR 4/6	10	C	M	silt loam	
4-8	2.5Y 2.5/1	40	7.5YR 4/6	20	C	M	Sandy silt loam	
	2.5Y 4/1	40					s	
8-18	2.5Y 2.5/1	80	7.5YR 4/6	20	C	M	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Receives runoff from adjacent ag field.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Kingwood Solar City/County: Greene Sampling Date: 10-20-20

Applicant/Owner: Land Lease State: OH Sampling Point: MMH-USP1

Investigator(s): M Martin, K. Lodge Section, Township, Range: _____

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): Concave

Slope (%): 5 Lat: 39.784910 Long: -83.836052 Datum: WGS84

Soil Map Unit Name: Ragsdale silty clay loam, 0-2% slopes NWI classification: —

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 ____, Soil ____, or Hydrology ____ naturally problematic? no (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 ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Herb Stratum (Plot size: 5')			
1. Ground ivy (Glechoma hederacea)	5	N	FACU
2. Soybean (Glycine max)	100	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		

Woody Vine Stratum (Plot size: —)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes ____ No X

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

Active ag field.

Sampling Point: MMH-USP1

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 4/3	100					sandy silt loam	
4-12	10YR 4/2	100					silty clay loam	
12-18	10YR 3/1	100					silty clay loam	
	10YR 4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Active ag field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Active ag field.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Kingwood Solar City/County: Greene Sampling Date: 3-10-21
Applicant/Owner: Lendlease State: OH Sampling Point: MMI-WSP1
Investigator(s): M. Martin Section, Township, Range: _____
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): none
Slope (%): 5 Lat: 39.764748 Long: -83.855237 Datum: WGS84
Soil Map Unit Name: Sloan silty clay loam NWI classification: PEM
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 _____, Soil _____, or Hydrology _____ naturally problematic? no (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 _____
Hydric Soil Present?	Yes ✓	No _____
Wetland Hydrology Present?	Yes ✓	No _____

Is the Sampled Area within a Wetland? Yes ✓ No _____

Remarks.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: –)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: –)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5')			
1. Cursed buttercup (Ranunculus sceleratus)	40	Y	OBL
2. Boneset (Eupatorium perfoliatum)	20	Y	OBL
3. Jewelweed (Impatiens capensis)	15	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75	= Total Cover	

Woody Vine Stratum (Plot size: –)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Veg impacted by use of the area as cow pasture.

SOIL

Sampling Point: MMI-WSP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR4/2	100					silt loam	
6-18	10YR4/2	90	10YR5/6	10	C	M	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0.5

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Kingwood Solar City/County: Greene Sampling Date: 3-10-21
Applicant/Owner: LendLease State: OH Sampling Point: MMT-USP1
Investigator(s): M. Martin Section, Township, Range: ____
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex
Slope (%): 3 Lat: 39.7647751 Long: -83.855184 Datum: WGS84
Soil Map Unit Name: Sloan silty clay loam NWI classification: —
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 ____, Soil ____, or Hydrology ____ naturally problematic? no (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 ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Herb Stratum (Plot size: 5')			
1. Red clover (Trifolium pratense)	50	Y	FACU
2. Grasses	50	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	____ = Total Cover		

Woody Vine Stratum (Plot size: —)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data 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.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
Impacted by use as cow pasture

SOIL

Sampling Point: MMT-USP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR4/2	100					silt loam	
2-18	10YR4/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar			DATE: 10-15-20
PROJECT NUMBER: G200127			COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin, K. Lodge			WEATHER: 50°, Cloudy
STREAM INFORMATION			
H&A STREAM ID: MM1	NEAREST FLAG #: MM1-65		WATER WIDTH: 7'
STREAM NAME: Clark Run			STREAM WIDTH: 7'
FLOW TYPE: ☑ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL			BANKFULL WIDTH: 12'
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: SW		PROBED STREAM DEPTH: 8"
OBSERVED WATER QUALITY: Turbid/Low (pasture)	CHANNEL SUBSTRATE: cobble, boulder, silt		
AQUATIC HABITAT ☐ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☑ AQUATIC VEGETATION ☑ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☑ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☑ FISH ☑ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☑ OTHER: cow pasture			
LEFT BANK HEIGHT: 3'	RIGHT BANK HEIGHT: 2.5'		BANK SUBSTRATE: silt loam
LEFT BANK SLOPE: 40%	RIGHT BANK SLOPE: 40%		EROSION POTENTIAL: high
MEANDER: moderate	GRADIENT: low		% CANOPY CLOSURE: 0
ADJACENT COMMUNITY TYPES: pasture			
DOMINANT TREES: —			
DOMINANT SHRUBS: —			
DOMINANT HERBACEOUS: upland grasses, clover, foxtail, bedstraw			

NOTES

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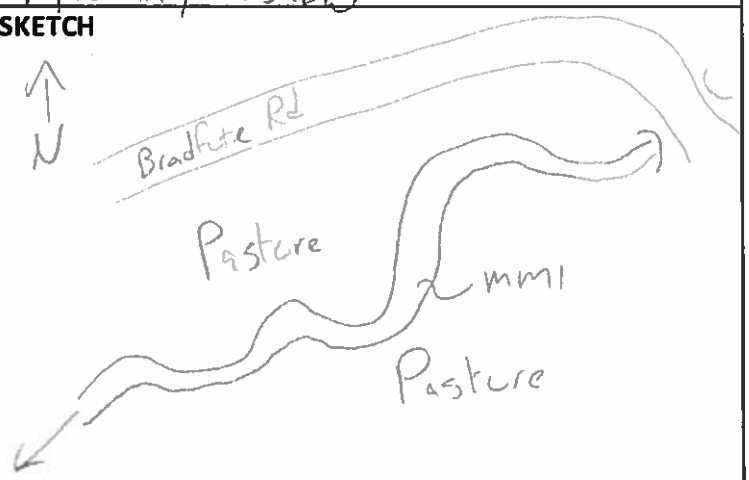

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 10/15/20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: drizzle, 50°	
STREAM INFORMATION			
H&A STREAM ID: MM2	NEAREST FLAG #: MM2-5	WATER WIDTH: 0	
STREAM NAME: —		STREAM WIDTH: 3'	
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 5'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: —	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: silt, cobble	
AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☑ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 0.5	RIGHT BANK HEIGHT: 0.5	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: low	
MEANDER: moderate	GRADIENT: low	% CANOPY CLOSURE: 0	
ADJACENT COMMUNITY TYPES: soybean field			
DOMINANT TREES: —			
DOMINANT SHRUBS: —			
DOMINANT HERBACEOUS: soy, jimson weed, cocklebur, foxtail, sorrel			

NOTES

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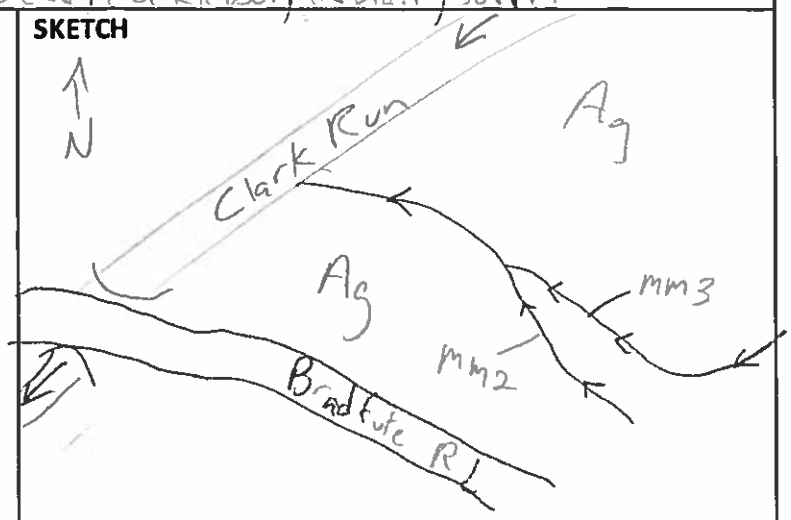

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 10/15/20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: Drizzle, 50°	
STREAM INFORMATION			
H&A STREAM ID: MM3	NEAREST FLAG #: MM3-3	WATER WIDTH: 0	
STREAM NAME: NA		STREAM WIDTH: 2'	
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 3'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: SW	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: silt	
AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☑ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 0.5'	RIGHT BANK HEIGHT: 0.5'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 20%	RIGHT BANK SLOPE: 20%	EROSION POTENTIAL: low	
MEANDER: mod/high	GRADIENT: low	% CANOPY CLOSURE: 0	
ADJACENT COMMUNITY TYPES: soybean field			
DOMINANT TREES: —			
DOMINANT SHRUBS: —			
DOMINANT HERBACEOUS: soy, jimson weed, foxtail, velvet leaf			

NOTES

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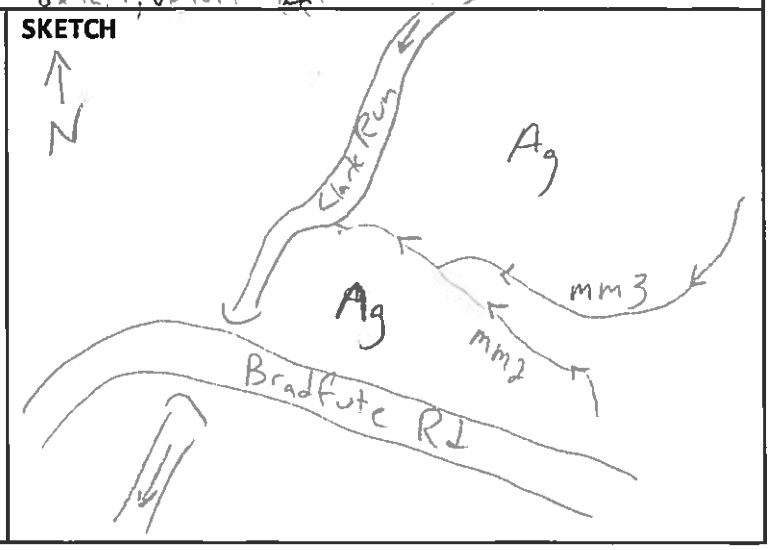

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 10-15-20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: 50°, rain	
STREAM INFORMATION			
H&A STREAM ID: MM4	NEAREST FLAG #: MM4-42	WATER WIDTH: —	
STREAM NAME: NA		STREAM WIDTH: 6'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 9'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: NW	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: NA		CHANNEL SUBSTRATE: cobble, boulder, silt	

AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 3'	RIGHT BANK HEIGHT: 3'	BANK SUBSTRATE: silt loam/clay
LEFT BANK SLOPE: 70%	RIGHT BANK SLOPE: 60%	EROSION POTENTIAL: high
MEANDER: low/mod	GRADIENT: moderate/steep	% CANOPY CLOSURE: 80%

ADJACENT COMMUNITY TYPES: pasture, soybeans

DOMINANT TREES: osage orange, cottonwood, black walnut

DOMINANT SHRUBS: honeysuckle, mulberry, princess tree

DOMINANT HERBACEOUS:

NOTES

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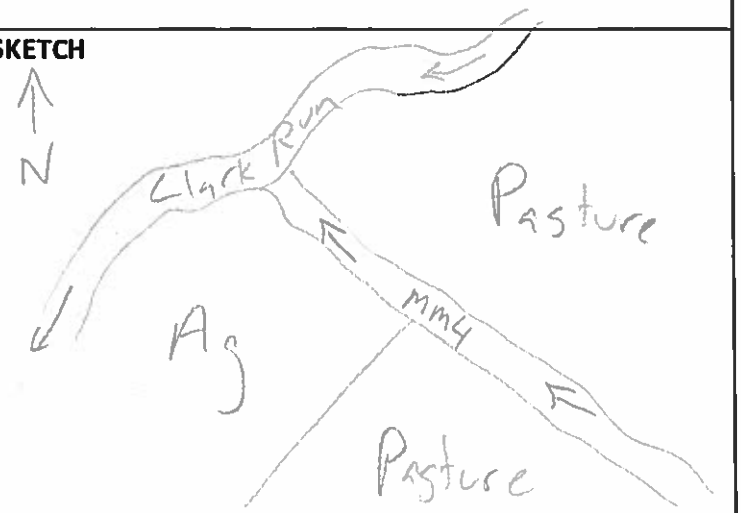

STREAM INVENTORY DATA FORM

PROJECT INFORMATION		
PROJECT NAME: KINGWOOD SOLAR		DATE: 10/17/20
PROJECT NUMBER: 135134 / 0260127		COUNTY/STATE: GREENE / OH
OBSERVER NAME: K. LODGE + M. MARTIN		WEATHER: SUNNY 50s
STREAM INFORMATION		
H&A STREAM ID: MM5	NEAREST FLAG #: 26	WATER WIDTH: —
STREAM NAME: —		STREAM WIDTH: 3
FLOW TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 5
PERCEPTIBLE FLOW: ☐ YES ☒ NO	FLOW DIRECTION: N	PROBED STREAM DEPTH: —
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: SILT, COBBLE, BOULDER

AQUATIC HABITAT ☒ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☒ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: SILT / SILT LOAM
LEFT BANK SLOPE: 1:2	RIGHT BANK SLOPE: 1:2	EROSION POTENTIAL: MOD-HIGH
MEANDER: MINOR	GRADIENT: FLAT	% CANOPY CLOSURE: 80-90%

ADJACENT COMMUNITY TYPES: ACTIVE CULTIVATED SOYBEAN

DOMINANT TREES: —

DOMINANT SHRUBS: —

DOMINANT HERBACEOUS: SOYBEAN, REED CANARY GRASS, COCKLEBUR, FOXTAIL GRASS, CATTAIL,

NOTES GIANT RAGWEED, PANIC / ZIGZAG GRASS
AGRICULTURAL DRAINAGE
ACTIVE SOYBEAN

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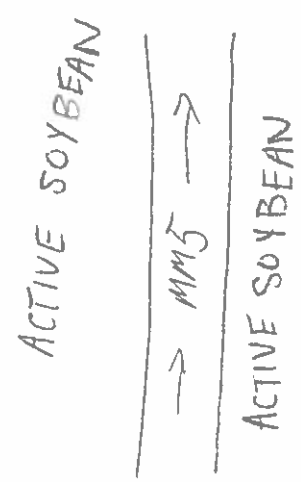

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 10/19/20 10/19	
PROJECT NUMBER: 0100127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: 40°, rain	
STREAM INFORMATION			
H&A STREAM ID: MM 6	NEAREST FLAG #: 34	WATER WIDTH: 5	
STREAM NAME: Clark Run		STREAM WIDTH: 5	
FLOW TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 6	
PERCEPTIBLE FLOW: ☒ YES ☐ NO	FLOW DIRECTION: SW	PROBED STREAM DEPTH: 5'	
OBSERVED WATER QUALITY: TURBID		CHANNEL SUBSTRATE: SILT + COBBLE	
AQUATIC HABITAT ☒ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☒ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☒ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☒ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: SILT/SILT LOAM	
LEFT BANK SLOPE: 1:1	RIGHT BANK SLOPE: 1:1	EROSION POTENTIAL: MOD	
MEANDER: MINOR	GRADIENT: FLAT	% CANOPY CLOSURE: 40	
ADJACENT COMMUNITY TYPES: PASTURE, FOREST			
DOMINANT TREES: WILLOW ASH MAPLE			
DOMINANT SHRUBS: HACK BERRY, HONEYSUCKLE			
DOMINANT HERBACEOUS: GOLDENROD, MINT, ROSE, ASTER			

NOTES

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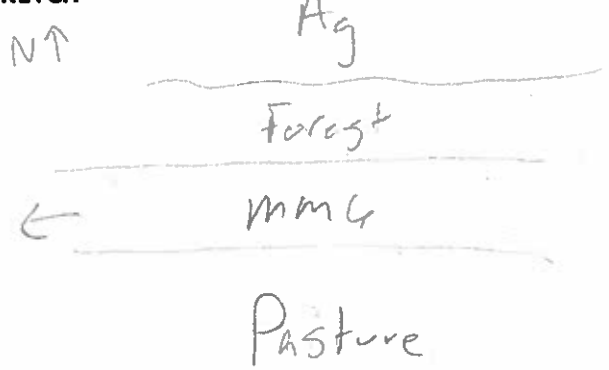
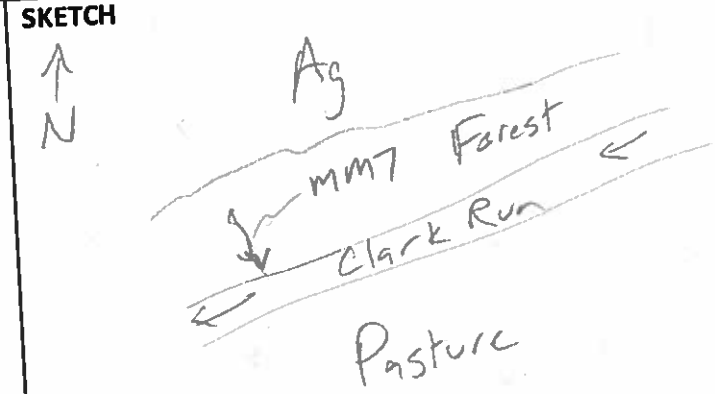


STREAM INVENTORY DATA FORM

PROJECT INFORMATION	
PROJECT NAME: Kingwood Solar	DATE: 10/19/20
PROJECT NUMBER: 0200127	COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin, K. Lodge	WEATHER: 40°, Rain
STREAM INFORMATION	
H&A STREAM ID: MM7 / NEAREST FLAG #: ~~4~~ 3	WATER WIDTH: 2'
STREAM NAME: —	STREAM WIDTH: 3'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL	BANKFULL WIDTH: 3'
PERCEPTIBLE FLOW: ☒ YES ☐ NO / FLOW DIRECTION: SE	PROBED STREAM DEPTH: 2"
OBSERVED WATER QUALITY: SLIGHTLY TURBID	CHANNEL SUBSTRATE: SILT
AQUATIC HABITAT ☒ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☒ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:	
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:	
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☒ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:	
LEFT BANK HEIGHT: 6" / RIGHT BANK HEIGHT: 6"	BANK SUBSTRATE: SILT / SILT LOAM
LEFT BANK SLOPE: 1:1 / RIGHT BANK SLOPE: 1:1	EROSION POTENTIAL: LOW-MOD
MEANDER: MINOR / GRADIENT: 5%	% CANOPY CLOSURE: 80-90
ADJACENT COMMUNITY TYPES: FOREST, CORN FIELD	
DOMINANT TREES: MAPLE, ASH	
DOMINANT SHRUBS: HONEYSUCKLE, ELM, OLIVE, DOGWOOD	
DOMINANT HERBACEOUS: WINTER CREEPER, ASTER, ROSE	

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar			DATE: 10/19/20
PROJECT NUMBER: 0200127			COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin, K. Lodge			WEATHER: 40°, rain
STREAM INFORMATION			
H&A STREAM ID: MM8	NEAREST FLAG #: MM8-2		WATER WIDTH: 3'
STREAM NAME: —			STREAM WIDTH: 3'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL			BANKFULL WIDTH: 3'
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: S		PROBED STREAM DEPTH: 2'
OBSERVED WATER QUALITY: turbid		CHANNEL SUBSTRATE: silt	

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☑ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: silty clay
LEFT BANK SLOPE: 40%	RIGHT BANK SLOPE: 40%	EROSION POTENTIAL: moderate
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 80

ADJACENT COMMUNITY TYPES: forest

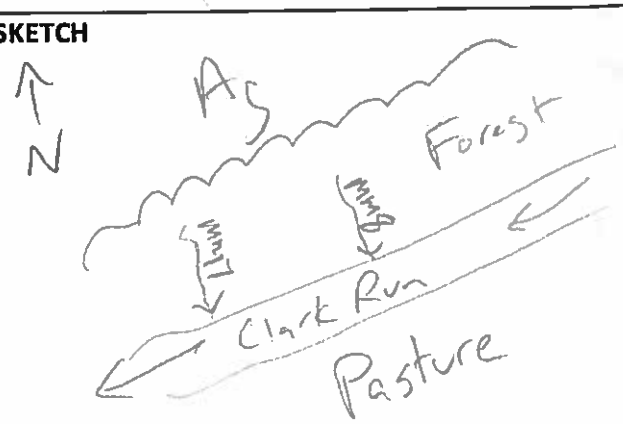
DOMINANT TREES: sugar maple, hackberry, cherry

DOMINANT SHRUBS: honeysuckle

DOMINANT HERBACEOUS: winter creeper

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION

PROJECT NAME: Kingwood Solar	DATE: 10/19/20
PROJECT NUMBER: 0100127	COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin, K. Ladge	WEATHER: 40°, Rain

STREAM INFORMATION

H&A STREAM ID: MM9	NEAREST FLAG #: MM9-6	WATER WIDTH: 2'
STREAM NAME: —		STREAM WIDTH: 2'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 4'
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: S	PROBED STREAM DEPTH: 2"
OBSERVED WATER QUALITY: slightly turbid	CHANNEL SUBSTRATE: silt	

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☑ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☑ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: clay loam
LEFT BANK SLOPE: 20%	RIGHT BANK SLOPE: 20%	EROSION POTENTIAL: low
MEANDER: low	GRADIENT: low moderate	% CANOPY CLOSURE: 0

ADJACENT COMMUNITY TYPES: corn, soy, scrub

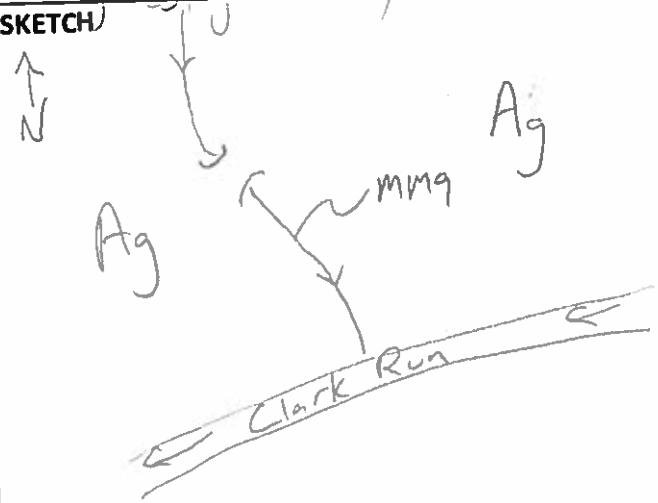
DOMINANT TREES:

DOMINANT SHRUBS:

DOMINANT HERBACEOUS: reed canary, rice cutgrass, ground ivy

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION		
PROJECT NAME: Kingwood Solar		DATE: 10-20-20
PROJECT NUMBER: 020127		COUNTY/STATE: Olt
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: rain, 50°
STREAM INFORMATION		
H&A STREAM ID: MM10	NEAREST FLAG #: MM10-13	WATER WIDTH: NA
STREAM NAME: —		STREAM WIDTH: 4'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 6'
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: SE	PROBED STREAM DEPTH: —
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: cobble, silt

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam
LEFT BANK SLOPE: 25%	RIGHT BANK SLOPE: 40%	EROSION POTENTIAL: moderate
MEANDER: moderate	GRADIENT: moderate	% CANOPY CLOSURE: 65%

ADJACENT COMMUNITY TYPES: Forest

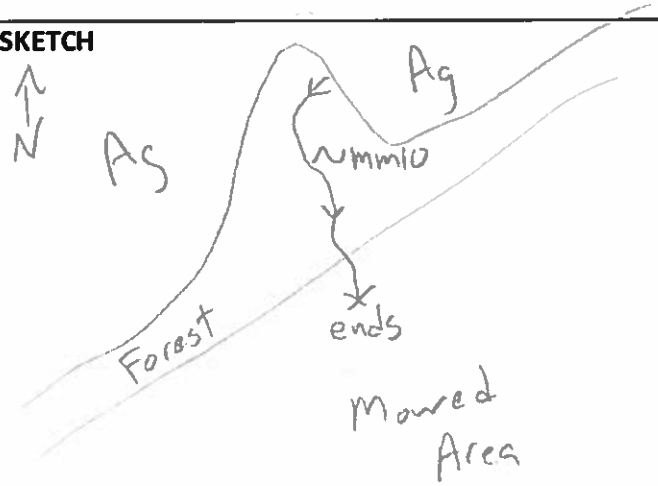
DOMINANT TREES: black walnut, hackberry, honey locusts

DOMINANT SHRUBS: Amur honeysuckle

DOMINANT HERBACEOUS: sparse

NOTES

SKETCH

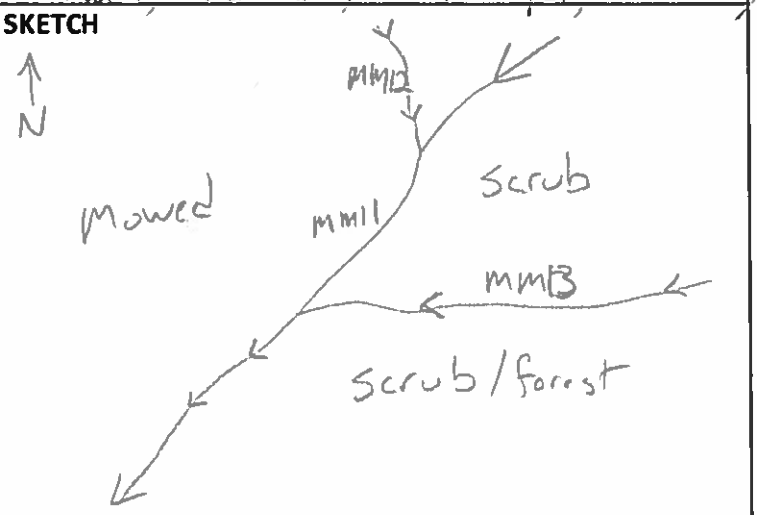


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood solar		DATE: 10-20-20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene / OH	
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: cloudy 50°	
STREAM INFORMATION			
H&A STREAM ID: MM11	NEAREST FLAG #: MM11-12	WATER WIDTH: —	
STREAM NAME: —		STREAM WIDTH: 3'	
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 4'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: S	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: cobble, silt, clay	
AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam	
LEFT BANK SLOPE: 40%	RIGHT BANK SLOPE: 20%	EROSION POTENTIAL: moderate	
MEANDER: moderate	GRADIENT: moderate	% CANOPY CLOSURE: 75%	
ADJACENT COMMUNITY TYPES: forest, scrub shrub,			
DOMINANT TREES: cottonwood, honey locust			
DOMINANT SHRUBS: Amur honeysuckle			
DOMINANT HERBACEOUS: Canada dearweed, butterweed, smartweed, winter creeper, red clover,			

NOTES

SKETCH

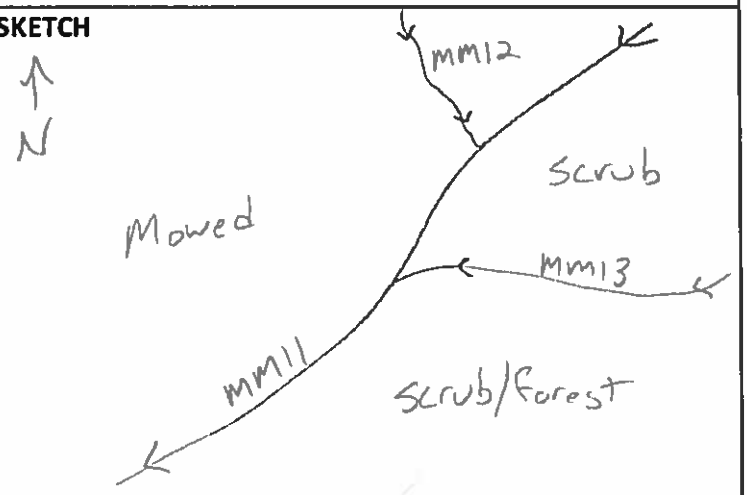


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood			DATE: 10-20-20
PROJECT NUMBER: 0200127			COUNTY/STATE: Greene / OH
OBSERVER NAME: M. Martin, K. Lodge			WEATHER: cloudy, 50°
STREAM INFORMATION			
H&A STREAM ID: MM12	NEAREST FLAG #: MM12-6		WATER WIDTH: —
STREAM NAME: —			STREAM WIDTH: 2'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL			BANKFULL WIDTH: 3'
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: SE		PROBED STREAM DEPTH: —
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: cobble, silt	
AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'		BANK SUBSTRATE: silty clay loam
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%		EROSION POTENTIAL: moderate
MEANDER: low	GRADIENT: moderate		% CANOPY CLOSURE: 20%
ADJACENT COMMUNITY TYPES: scrub shrub			
DOMINANT TREES: Honey locust			
DOMINANT SHRUBS: Amur honeysuckle			
DOMINANT HERBACEOUS: reed canary			

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION		
PROJECT NAME: Kinnwood solar		DATE: 10-20-20
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, Ohio
OBSERVER NAME: M. Martin, K. Lodge		WEATHER: 50°, cloudy
STREAM INFORMATION		
H&A STREAM ID: MM13	NEAREST FLAG #: MM13-8	WATER WIDTH: —
STREAM NAME: —		STREAM WIDTH: 3'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 4'
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: W	PROBED STREAM DEPTH: —
OBSERVED WATER QUALITY: —	CHANNEL SUBSTRATE: cobble, silt, clay	

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 40%	EROSION POTENTIAL: mod/high
MEANDER: low moderate	GRADIENT: moderate	% CANOPY CLOSURE: 85%

ADJACENT COMMUNITY TYPES: forest, scrub shrub

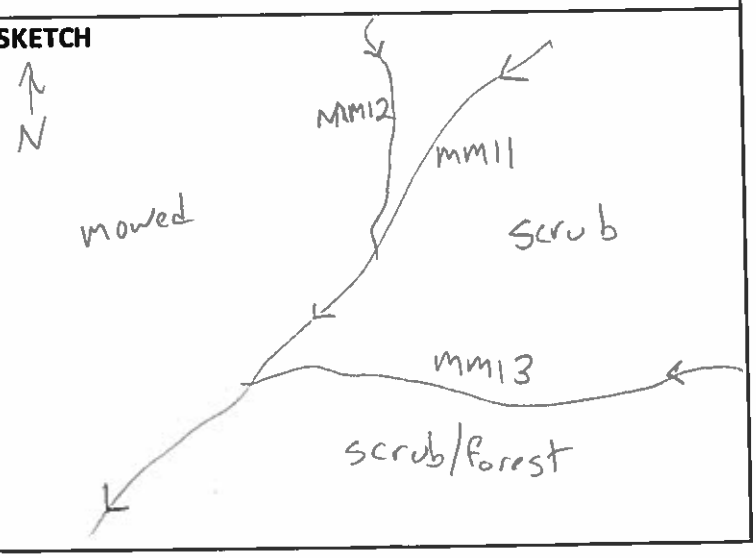
DOMINANT TREES: cottonwood, honey locust,

DOMINANT SHRUBS: Amur honeysuckle

DOMINANT HERBACEOUS: sparse

NOTES

SKETCH

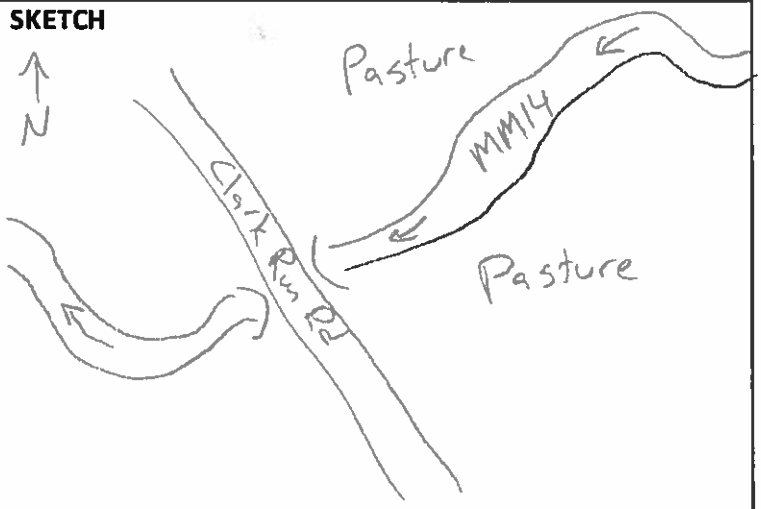


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 10-21-20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene/Ohio	
OBSERVER NAME: M. Martin		WEATHER: partly cloudy/65	
STREAM INFORMATION			
H&A STREAM ID: MM14	NEAREST FLAG #: MM14-45	WATER WIDTH: 10'	
STREAM NAME: Clark Run		STREAM WIDTH: 10'	
FLOW TYPE: ☑ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 15'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: SW	PROBED STREAM DEPTH: 2'	
OBSERVED WATER QUALITY: turbid		CHANNEL SUBSTRATE: silt, cobble	
AQUATIC HABITAT ☑ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☑ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☑ FISH ☑ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☑ OTHER: Pasture			
LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam	
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 40%	EROSION POTENTIAL: moderat	
MEANDER: moderate	GRADIENT: low/mod	% CANOPY CLOSURE: 5%	
ADJACENT COMMUNITY TYPES: pasture, woodland			
DOMINANT TREES: sycamore, honey, hoist			
DOMINANT SHRUBS: honeysuckle			
DOMINANT HERBACEOUS: grasses clover			

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar			DATE: 10-21-20
PROJECT NUMBER: 0200127			COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin			WEATHER: cloudy, 65°
STREAM INFORMATION			
H&A STREAM ID: MM15	NEAREST FLAG #: MM15-2		WATER WIDTH: 2'
STREAM NAME: —			STREAM WIDTH: 2'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL			BANKFULL WIDTH: 4'
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: SW		PROBED STREAM DEPTH: 2"
OBSERVED WATER QUALITY: slightly turbid		CHANNEL SUBSTRATE: cobble 50% silt 50%	

AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☑ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam
LEFT BANK SLOPE: 50%	RIGHT BANK SLOPE: 50%	EROSION POTENTIAL: low
MEANDER: low	GRADIENT: mod	% CANOPY CLOSURE: 20%

ADJACENT COMMUNITY TYPES: forest

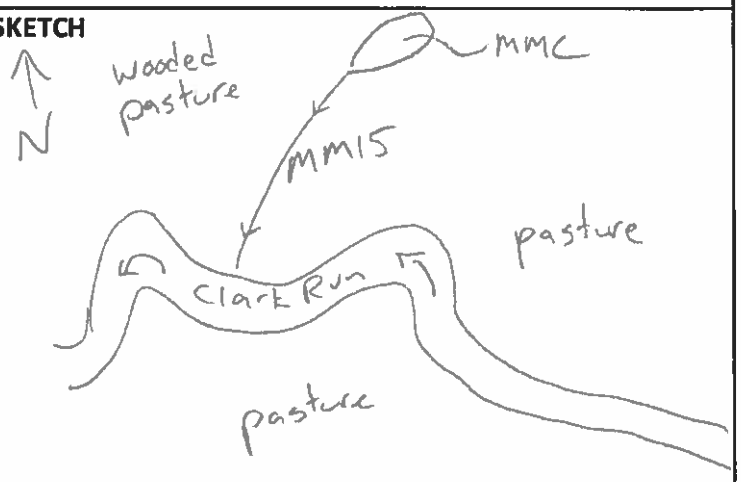
DOMINANT TREES: walnut mulberry

DOMINANT SHRUBS: honeysuckle

DOMINANT HERBACEOUS: grasses

NOTES

SKETCH



STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar			DATE: 10-21-20
PROJECT NUMBER: 0200127			COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin			WEATHER: cloudy, 65°
STREAM INFORMATION			
H&A STREAM ID: MM16	NEAREST FLAG #: MM16-3		WATER WIDTH: —
STREAM NAME: —			STREAM WIDTH: 2'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL			BANKFULL WIDTH: 7'
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: SW		PROBED STREAM DEPTH: —
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: silt 70, clay 30	

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: clay loam
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: low
MEANDER: high	GRADIENT: moderate	% CANOPY CLOSURE: 70

ADJACENT COMMUNITY TYPES: forest/pasture

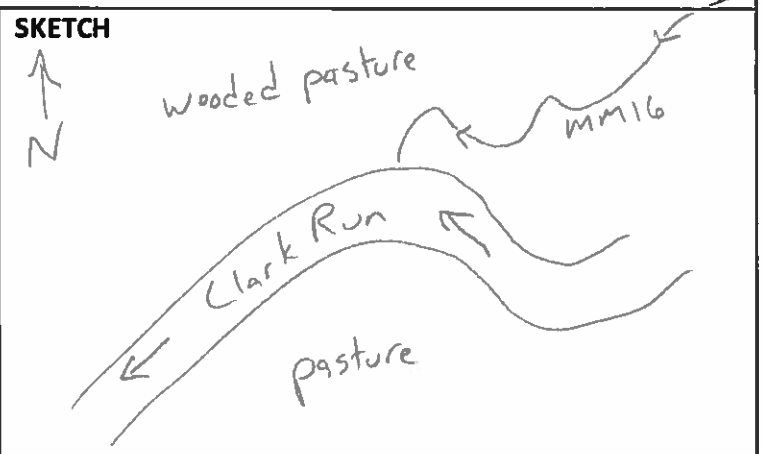
DOMINANT TREES: black walnut, osage orange,

DOMINANT SHRUBS: honeysuckle

DOMINANT HERBACEOUS: grasses

NOTES

SKETCH

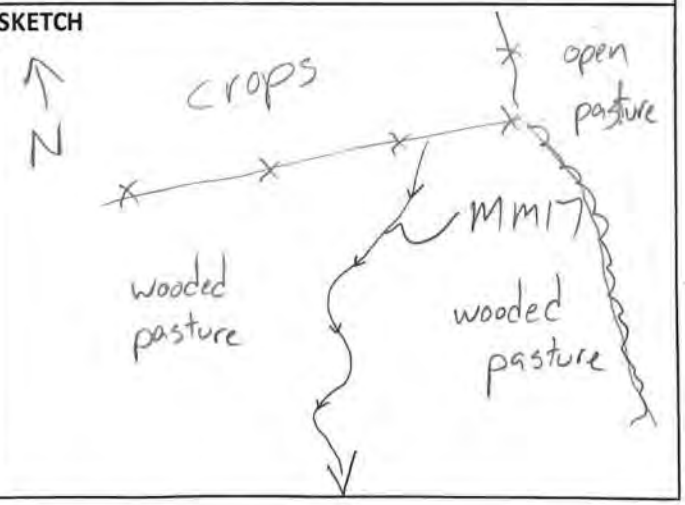


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 11/18/20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: Sunny, 40°	
STREAM INFORMATION			
H&A STREAM ID: MM17	NEAREST FLAG #: MM17-3	WATER WIDTH: 0	
STREAM NAME: —		STREAM WIDTH: 2'	
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 4'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: —	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: silt, clay, cobble	
AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:			
LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: moderate	
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 60%	
ADJACENT COMMUNITY TYPES: scrub/forest			
DOMINANT TREES: oak			
DOMINANT SHRUBS: honeysuckle			
DOMINANT HERBACEOUS:			

NOTES

SKETCH

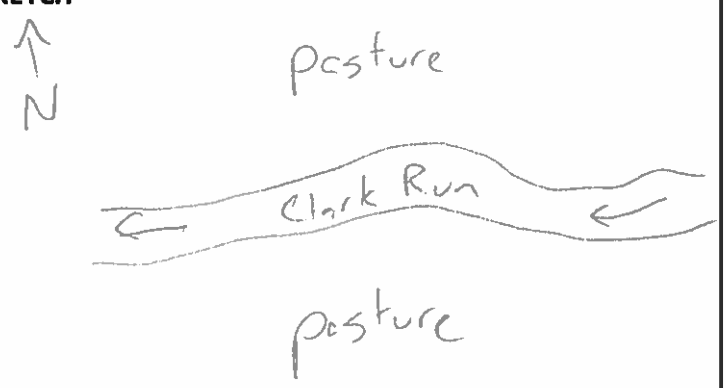


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 11-18-20	
PROJECT NUMBER: 0100127		COUNTY/STATE: Greene	
OBSERVER NAME: M. Martin		WEATHER: Sunny, 40°	
STREAM INFORMATION			
H&A STREAM ID: MM18	NEAREST FLAG #: MM18-4	WATER WIDTH: 8'	
STREAM NAME: Clark Run		STREAM WIDTH: 8'	
FLOW TYPE: ☑ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 13'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: SW	PROBED STREAM DEPTH: 4"	
OBSERVED WATER QUALITY: clear		CHANNEL SUBSTRATE: cobble, gravel, sand	
AQUATIC HABITAT ☑ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☑ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☑ OTHER: pasture			
LEFT BANK HEIGHT: 6'	RIGHT BANK HEIGHT: 50%	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 6'	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: high	
MEANDER: moderate	GRADIENT: low/moderate	% CANOPY CLOSURE: 60	
ADJACENT COMMUNITY TYPES: pasture			
DOMINANT TREES: Osage orange			
DOMINANT SHRUBS: honeysuckle			
DOMINANT HERBACEOUS: grasses			

NOTES

SKETCH

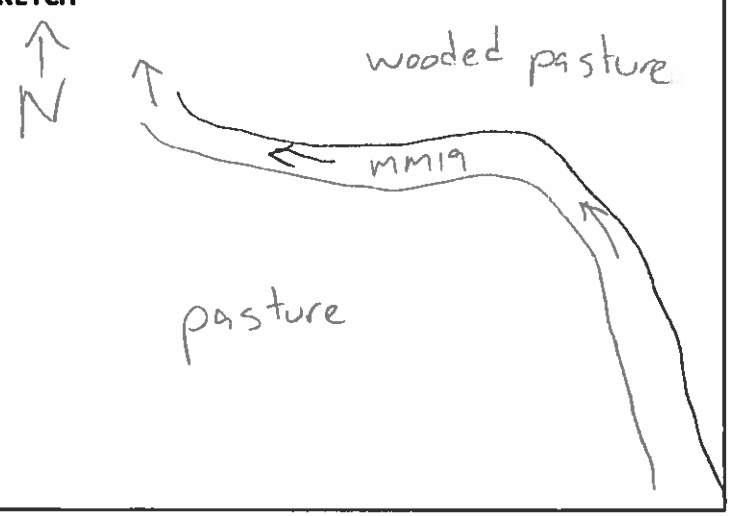


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 11/18/20	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 40°, sunny	
STREAM INFORMATION			
H&A STREAM ID: MM19	NEAREST FLAG #: MM19-7	WATER WIDTH: NA	
STREAM NAME: —		STREAM WIDTH: 8'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 15'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: W	PROBED STREAM DEPTH: NA	
OBSERVED WATER QUALITY: NA		CHANNEL SUBSTRATE: cobble, boulder, bedrock	
AQUATIC HABITAT ☐ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☑ DEEP HOLES ☐ OTHER:			
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:			
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☑ OTHER: pasture			
LEFT BANK HEIGHT: 3'	RIGHT BANK HEIGHT: 3'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 45%	RIGHT BANK SLOPE: 45%	EROSION POTENTIAL: high	
MEANDER:	GRADIENT: moderate/high	% CANOPY CLOSURE: 50%	
ADJACENT COMMUNITY TYPES: pasture			
DOMINANT TREES: black walnut, hackberry, osage orange			
DOMINANT SHRUBS: multiflora rose			
DOMINANT HERBACEOUS: grasses			

NOTES

SKETCH



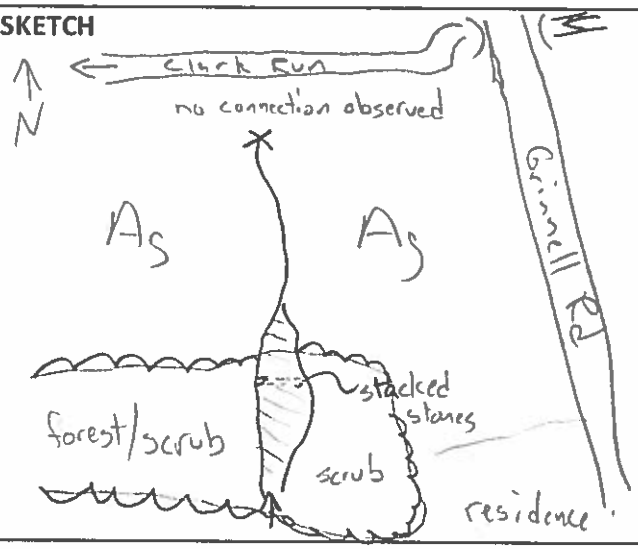
STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-9-21	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: Sunny 55°	
STREAM INFORMATION			
H&A STREAM ID: MM20	NEAREST FLAG #: MM2-3	WATER WIDTH: 8'	
STREAM NAME: —		STREAM WIDTH: 10'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 12'	
PERCEPTIBLE FLOW: ☐ YES ☐ NO	FLOW DIRECTION: N	PROBED STREAM DEPTH: 2"	
OBSERVED WATER QUALITY: clear		CHANNEL SUBSTRATE: cobble, boulder	
AQUATIC HABITAT	☑ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☑ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED	☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE	☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: mod/high	
MEANDER: low/mod	GRADIENT: moderate	% CANOPY CLOSURE: 80	
ADJACENT COMMUNITY TYPES: scrub/early successional forest			
DOMINANT TREES: Osage orange, cottonwood			
DOMINANT SHRUBS: Osage orange			
DOMINANT HERBACEOUS: sparse			

NOTES

Possible remnants of an old stacked stone dam. Flowing water in scrub portion but dissapates in corn field. Channel does not reach Clark Run

SKETCH

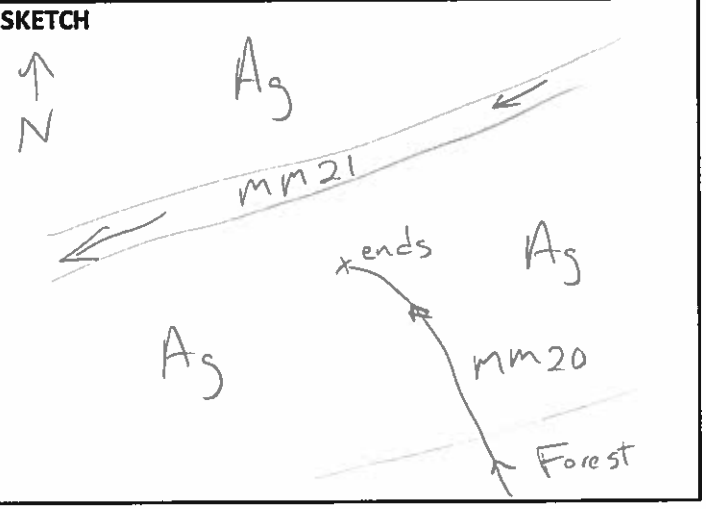


STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-9-2021	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 65° sunny	
STREAM INFORMATION			
H&A STREAM ID: MM21	NEAREST FLAG #: MM21-12	WATER WIDTH: 16'	
STREAM NAME: Clark Run		STREAM WIDTH: 20'	
FLOW TYPE: ☑ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 28'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: east	PROBED STREAM DEPTH: 8"	
OBSERVED WATER QUALITY: clear		CHANNEL SUBSTRATE: cobble, silt, sand	
AQUATIC HABITAT	☐ OVERHANGING ☑ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☑ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED	☐ WATERFOWL ☐ TURTLES ☑ INVERTEBRATES ☑ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE	☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 4'	RIGHT BANK HEIGHT: 4'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: moderate	
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 0	
ADJACENT COMMUNITY TYPES: Agriculture			
DOMINANT TREES:			
DOMINANT SHRUBS:			
DOMINANT HERBACEOUS: goldenrod, grasses, corn			

NOTES

SKETCH



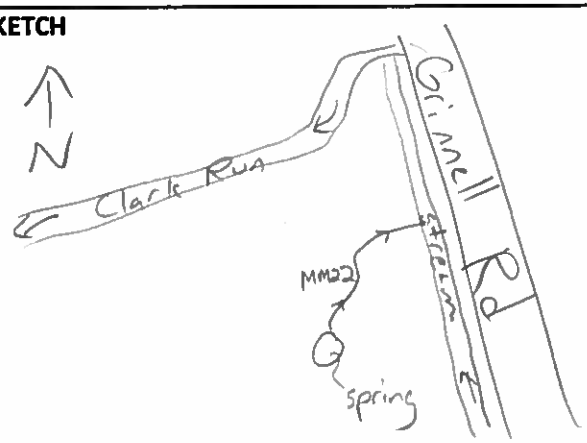
STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-9-2021	
PROJECT NUMBER: 0300127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 65°, sunny	
STREAM INFORMATION			
H&A STREAM ID: MM22	NEAREST FLAG #: MM22-4	WATER WIDTH: 2'	
STREAM NAME: —		STREAM WIDTH: 2'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 3'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: NE	PROBED STREAM DEPTH: 3"	
OBSERVED WATER QUALITY: clear		CHANNEL SUBSTRATE: silt, sand	
AQUATIC HABITAT	☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED	☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE	☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 40%	RIGHT BANK SLOPE: 40%	EROSION POTENTIAL: low	
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 0	
ADJACENT COMMUNITY TYPES: herbaceous			
DOMINANT TREES:			
DOMINANT SHRUBS:			
DOMINANT HERBACEOUS: grasses			

NOTES

Fed by spring at base of a small hill.

SKETCH



@PJL INFO SUPPLIES

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-9-2021	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 65°, sunny	
STREAM INFORMATION			
H&A STREAM ID: MM23	NEAREST FLAG #: MM23-15	WATER WIDTH: 10'	
STREAM NAME: —		STREAM WIDTH: 10'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 20'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: NW	PROBED STREAM DEPTH: 2"	
OBSERVED WATER QUALITY: clear		CHANNEL SUBSTRATE: cobble	
AQUATIC HABITAT	☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED	☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE	☐ DRINKING ☐ SWIMMING ☑ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 6'	RIGHT BANK HEIGHT: 3'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 50%	RIGHT BANK SLOPE: 25%	EROSION POTENTIAL: moderate	
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 50%	
ADJACENT COMMUNITY TYPES: road shoulder / ag			
DOMINANT TREES: locust, maple			
DOMINANT SHRUBS: honeysuckle			
DOMINANT HERBACEOUS:			

NOTES

SKETCH

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STREAM INVENTORY DATA FORM

PROJECT INFORMATION		
PROJECT NAME: Kingwood Solar		DATE: 3-9-2021
PROJECT NUMBER: 0500127		COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin		WEATHER: 65°, sunny
STREAM INFORMATION		
H&A STREAM ID: MM24	NEAREST FLAG #: MM24-2	WATER WIDTH: 1'
STREAM NAME: —		STREAM WIDTH: 1'
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 2'
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: NW	PROBED STREAM DEPTH: 1"
OBSERVED WATER QUALITY: clear	CHANNEL SUBSTRATE: sand, silt	

AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE:
LEFT BANK SLOPE: 50%	RIGHT BANK SLOPE: 50%	EROSION POTENTIAL:
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 0

ADJACENT COMMUNITY TYPES: ag, Grinnell Rd

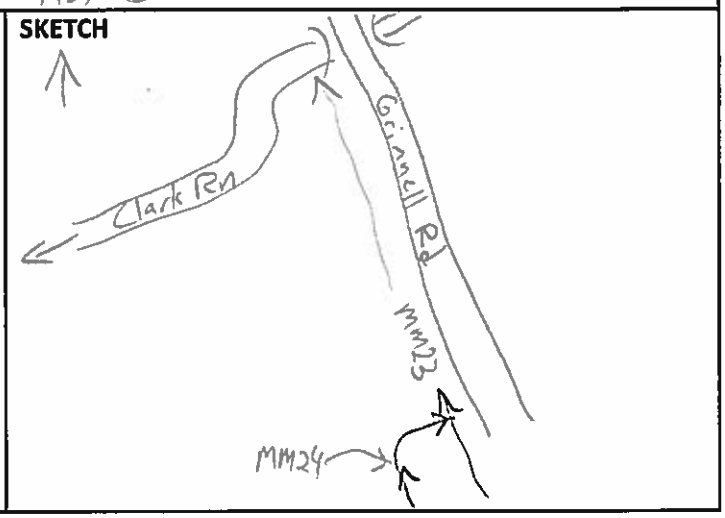
DOMINANT TREES:

DOMINANT SHRUBS: honeysuckle

DOMINANT HERBACEOUS: grasses, goldenrod asters

NOTES

SKETCH



@PJL INFO SUPPLIES

STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-10-2021	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 70°, sunny	
STREAM INFORMATION			
H&A STREAM ID: MM25	NEAREST FLAG #: MM25-5	WATER WIDTH: 1'	
STREAM NAME: —		STREAM WIDTH: 1'	
FLOW TYPE: ☐ PERENNIAL ☑ INTERMITTENT ☐ EPHEMERAL		BANKFULL WIDTH: 3'	
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: S	PROBED STREAM DEPTH: 1"	
OBSERVED WATER QUALITY: Clear		CHANNEL SUBSTRATE: sand, silt	

AQUATIC HABITAT ☐ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:

WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:

OBSERVED USE ☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:

LEFT BANK HEIGHT: 1'	RIGHT BANK HEIGHT: 1'	BANK SUBSTRATE: silt loam
LEFT BANK SLOPE: 50%	RIGHT BANK SLOPE: 50%	EROSION POTENTIAL: moderate
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 20%

ADJACENT COMMUNITY TYPES: pasture

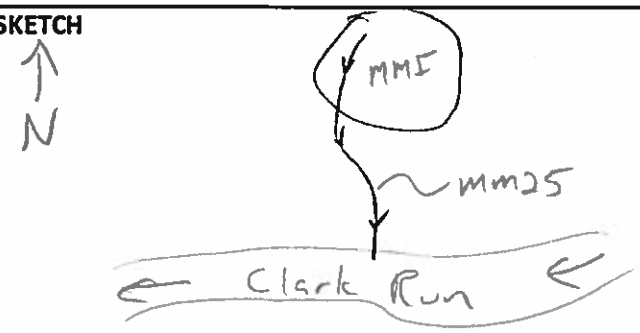
DOMINANT TREES:

DOMINANT SHRUBS: osage orange

DOMINANT HERBACEOUS: grasses

NOTES

SKETCH



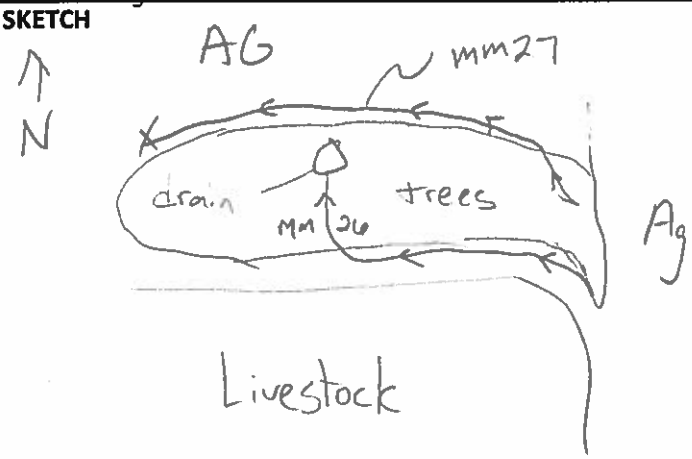
@PJL INFO SUPPLIES

STREAM INVENTORY DATA FORM

PROJECT INFORMATION		
PROJECT NAME: Kingwood Solar		DATE: 3-11-21
PROJECT NUMBER: 0300127		COUNTY/STATE: Greene, OH
OBSERVER NAME: M. Martin		WEATHER: 60°, sunny
STREAM INFORMATION		
H&A STREAM ID: MM26	NEAREST FLAG #: MM26-3	WATER WIDTH: 3'
STREAM NAME: —		STREAM WIDTH: 3'
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH:
PERCEPTIBLE FLOW: ☑ YES ☐ NO	FLOW DIRECTION: N	PROBED STREAM DEPTH: 2"
OBSERVED WATER QUALITY: clear	CHANNEL SUBSTRATE: silt, cobble	
AQUATIC HABITAT ☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED ☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE ☐ DRINKING ☐ SWIMMING ☑ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: silt loam
LEFT BANK SLOPE: 30%	RIGHT BANK SLOPE: 30%	EROSION POTENTIAL: low
MEANDER: low	GRADIENT: moderate	% CANOPY CLOSURE: 20
ADJACENT COMMUNITY TYPES: woodlot		
DOMINANT TREES: cottonwood		
DOMINANT SHRUBS: raspberry		
DOMINANT HERBACEOUS: aster, goldenrod, giant ragweed		

NOTES

SKETCH



@PJL INFO SUPPLIES

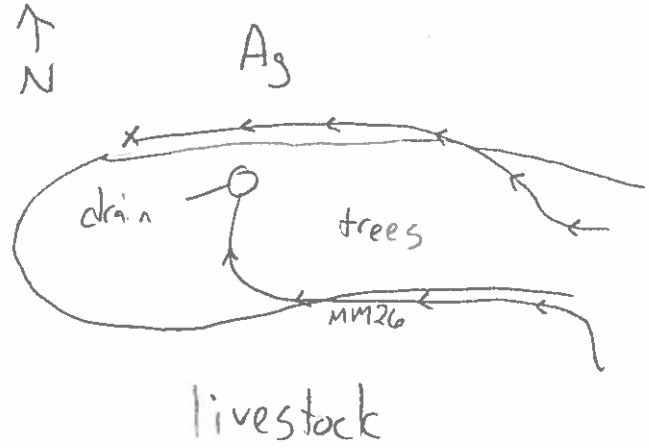
STREAM INVENTORY DATA FORM

PROJECT INFORMATION			
PROJECT NAME: Kingwood Solar		DATE: 3-11-21	
PROJECT NUMBER: 0200127		COUNTY/STATE: Greene, OH	
OBSERVER NAME: M. Martin		WEATHER: 60°, sunny	
STREAM INFORMATION			
H&A STREAM ID: MM27	NEAREST FLAG #: MM27-7	WATER WIDTH: —	
STREAM NAME: —		STREAM WIDTH: 6'	
FLOW TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☑ EPHEMERAL		BANKFULL WIDTH: 10'	
PERCEPTIBLE FLOW: ☐ YES ☑ NO	FLOW DIRECTION: —	PROBED STREAM DEPTH: —	
OBSERVED WATER QUALITY: —		CHANNEL SUBSTRATE: silt, silt loam	
AQUATIC HABITAT	☑ OVERHANGING ☐ COBBLE RIFFLES ☐ MUD BAR ☐ TREES/SHRUBS ☐ SAND BAR ☐ SAND/GRAVEL BEACH BAR ☐ AQUATIC VEGETATION ☐ DEEP HOLES ☐ OTHER:		
WILDLIFE OBSERVED	☐ WATERFOWL ☐ TURTLES ☐ INVERTEBRATES ☐ FISH ☐ FROGS ☐ SALAMANDERS ☐ OTHER:		
OBSERVED USE	☐ DRINKING ☐ SWIMMING ☐ DRAINAGE ☐ IRRIGATION ☐ FISHING ☐ BOATING ☐ OTHER:		
LEFT BANK HEIGHT: 2'	RIGHT BANK HEIGHT: 2'	BANK SUBSTRATE: silt loam	
LEFT BANK SLOPE: 25%	RIGHT BANK SLOPE: 25%	EROSION POTENTIAL: moderate	
MEANDER: moderate	GRADIENT: moderate	% CANOPY CLOSURE: 10	
ADJACENT COMMUNITY TYPES: woodlot, ag			
DOMINANT TREES: cottonwood			
DOMINANT SHRUBS: raspberry			
DOMINANT HERBACEOUS: aster, goldenrod, giant ragweed, corn			

NOTES

During periods of high water it appears flow may enter an agricultural drainage system.

SKETCH



@PJL INFO SUPPLIES

Background Information

Name:	K. LODGE + M. MARTIN
Date:	10/15/20
Affiliation:	H+A
Address:	200 TOWN CENTRE DRIVE, SUITE 2, ROCHESTER, NY 14623
Phone Number:	585-321-4265
e-mail address:	mmartin@haleyaldrich.com
Name of Wetland:	MMC
Vegetation Communit(ies):	PEM
HGM Class(es):	DEPRESSION
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	SEE DEL REPORT MAPS

Lat/Long or UTM Coordinate	39.751957N, 83.885067W
USGS Quad Name	Yellow Springs
County	Greene
Township	Xenia Township
Section and Subsection	
Hydrologic Unit Code	05090202
Site Visit	10/15/20
National Wetland Inventory Map	No
Ohio Wetland Inventory Map	No
Soil Survey	Greene County Soil Survey
Delineation report/map	Figure 4 of Wetland Delineation Report

Name of Wetland: MMC

Wetland Size (acres, hectares): 0.04 ac

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

SEE DEL REPORT MAPS

Comments, Narrative Discussion, Justification of Category Changes:

Small emergent wetland at the base of agricultural filter strip/drain tile. Drains through a small ephemeral channel southwest to Clark Run.

Final score : 9 **Category:** 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: MMC	Rater(s): K. LODGE + M. MARTIN	Date: 10/15

Metric 1. Wetland Area (size).

max 6 pts. | subtotal: 0 | 0

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)
- [ ] 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.

max 14 pts. | subtotal: 1 | 1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] 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)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] 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)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts. | subtotal: 4 | 5

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] 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)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [X] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

max 20 pts. | subtotal: 5 | 10

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [X] Recovered (3)
- [ ] 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)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [X] farming
- [ ] nutrient enrichment

subtotal this page: 10

last revised 1 February 2001 jjm

Site: MMC	Rater(s): M. MARTIN + K. LODGE	Date: 10-15

10
subtotal first page

Metric 5. Special Wetlands.

0	10
max 10 pts.	subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

-1	9
max 20 pts.	subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [1] Emergent
- [0] Shrub
- [0] Forest
- [0] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

9

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MMC

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	7	
	Metric 4. Habitat	5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	-1	
	TOTAL SCORE	12	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

MMC

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	K. LODGE + M. MARTIN
Date:	10/16/20
Affiliation:	H+A
Address:	200 Town Centre Drive, Suite 2, Rochester, NY 14623
Phone Number:	585-321-4265
e-mail address:	mmartin@haleyaldrich.com
Name of Wetland:	MMD
Vegetation Communit(ies):	PEM
HGM Class(es):	depression
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	SEE DEL. REPORT MAP

Lat/Long or UTM Coordinate	39.775210N, 83.839847W
USGS Quad Name	Clifton
County	Greene
Township	Miami
Section and Subsection	
Hydrologic Unit Code	05090202
Site Visit	10-16-20
National Wetland Inventory Map	No
Ohio Wetland Inventory Map	No
Soil Survey	Greene County Soil Survey
Delineation report/map	Figure 4 & Wetland Delineation Rpt

Name of Wetland: MMD

Wetland Size (acres, hectares): 0.13 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

SEE DEL. REPORT MAPS

Comments, Narrative Discussion, Justification of Category Changes:

Small depressional wetland on the edge of an active agricultural field. Evidence of equipment movement around / through wetland. Wetland on edge of study area and appears isolated from other waters.

Final score : 28 **Category:** 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: MMD	Rater(s): M. Martin + K. Lodge	Date: 10-16-20

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

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)
- [X] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

1	2
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] 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)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] 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)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15	17
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other _____

8	25
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] 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)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [X] farming
- [ ] nutrient enrichment

25
subtotal this page

last revised 1 February 2001 jjm

Site: MMD	Rater(s): M. Martin + K. Lodge	Date: 10-16-20

25
subtotal first page

Metric 5. Special Wetlands.

0	25
max 10 pts.	subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

3	28
max 20 pts.	subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [1] Emergent
- [0] Shrub
- [0] Forest
- [0] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

28

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MMD

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	15	
	Metric 4. Habitat	8	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	28	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

MMD

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: K. LODGE + M. MARTIN	
Date: 10/16/20	
Affiliation: H+A	
Address: 200 Town Centre Drive, Suite 2, Rochester, NY 14623	
Phone Number: 585-321-4265	
e-mail address: mmartin@haleyaldrich.com	
Name of Wetland: MME	
Vegetation Communit(ies): PFO	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See delineation report maps	
Lat/Long or UTM Coordinate 39.772363, -83.841755	
USGS Quad Name Clifton	
County Greene	
Township Miami	
Section and Subsection	
Hydrologic Unit Code 05090202	
Site Visit 10/16/20	
National Wetland Inventory Map No	
Ohio Wetland Inventory Map No	
Soil Survey Greene County Soil Survey	
Delineation report/map Figure 4 of Wetland Delineation Report	

Name of Wetland: MME

Wetland Size (acres, hectares): 0.9 acres

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See delineation report

Comments, Narrative Discussion, Justification of Category Changes:

Forested, depression on the edge of an active agricultural field/residential home site. Appears to be evidence of abandoned, shallow ditch within the wetland.

Final score : 43 **Category:** 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: MME	Rater(s): M. Martin + K. Lodge	Date: 10-16-20

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
1	1

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)
- [x] 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.

max 14 pts.	subtotal
4	5

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts.	subtotal
14	19

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [x] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] 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)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
16	35

4a. Substrate disturbance. Score one or double check and average.

- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] 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)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

35

subtotal this page

last revised 1 February 2001 jjm

Site: MME	Rater(s): M. Martin + K. Lodge	Date: 10-16-20

35
subtotal first page

Metric 5. Special Wetlands.

0	35
max 10 pts.	subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

8	43
max 20 pts.	subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [0] Emergent
- [2] Shrub
- [2] Forest
- [0] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [X] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

43

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MME

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	4	
	Metric 3. Hydrology	14	
	Metric 4. Habitat	16	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	8	
	TOTAL SCORE	43	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

MME

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	K. LODGE + M. MARTIN
Date:	10/19/20
Affiliation:	H+A
Address:	200 Town Centre Drive, Suite 2, Rochester, NY 14623
Phone Number:	585-321-4265
e-mail address:	mmartin@haleyaldrich.com
Name of Wetland:	MMG
Vegetation Communit(ies):	PEM
HGM Class(es):	riparian
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	See delineation report

Lat/Long or UTM Coordinate	39.770613N, 83.833895
USGS Quad Name	Clifton
County	Green
Township	Miami
Section and Subsection	
Hydrologic Unit Code	05090202
Site Visit	10/19/20
National Wetland Inventory Map	No
Ohio Wetland Inventory Map	No
Soil Survey	Greene County Soil Survey
Delineation report/map	Figure 4 of Wetland Delineation Rpt

Name of Wetland: MMG

Wetland Size (acres, hectares): 0.3 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See delineation report

Comments, Narrative Discussion, Justification of Category Changes:

Small emergent wetland on slope adjacent to Clark Run. May have been mowed or grazed in the past.

Final score : 40 **Category:** 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: MMG	Rater(s): M. Martin & K. Lodge	Date: 10/19

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
2	2

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)
- [x] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 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.

max 14 pts.	subtotal
3	5

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] 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)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts.	subtotal
17	22

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [x] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other _____

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
15	37

4a. Substrate disturbance. Score one or double check and average.

- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] 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)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

37
subtotal this page

last revised 1 February 2001 jjm

Site: MMG	Rater(s): M. Martin, K. Lodge	Date: 10-19-20

37
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 37 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

3 (max 20 pts.) | 40 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [1] Emergent
- [1] Shrub
- [0] Forest
- [0] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

40

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MMG

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	17	
	Metric 4. Habitat	15	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	40	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: K. Lodge + M. Martin	
Date: 10-20-20	
Affiliation: H+A	
Address: 200 Town Centre Drive, Suite 2, Rochester, NY 14623	
Phone Number: 585-321-4265	
e-mail address: mmartin@haleyaldrich.com	
Name of Wetland: MMH	
Vegetation Communit(ies): PEM	
HGM Class(es): depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See delineation report	
Lat/Long or UTM Coordinate 39.784842N, 83.836134	
USGS Quad Name Clifton	
County Greene	
Township Miami	
Section and Subsection	
Hydrologic Unit Code 05090202	
Site Visit 10-20-20	
National Wetland Inventory Map NO	
Ohio Wetland Inventory Map NO	
Soil Survey G	
Delineation report/map Figure 4 of Wetland Delineation Rpt	

Name of Wetland: MMH

Wetland Size (acres, hectares): 0.06 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See delineation report

Comments, Narrative Discussion, Justification of Category Changes:

Small linear swale/depression in agricultural field. Becomes channelized flow outside the study area.

Final score : 15 **Category:** 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: 10-20-20	Rater(s): M.Martin + K. Lodge	Date: 10-20-20

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
0	0

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)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [x] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

max 14 pts.	subtotal
1	1

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] 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)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] 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)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts.	subtotal
4	5

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [x] 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)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other farm equipment trks

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
6	11

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [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)
- [x] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [x] farming
- [ ] nutrient enrichment

subtotal this page
11

last revised 1 February 2001 jjm

Site: MMH	Rater(s): M. Martin + K. Lodge	Date: 10-20-20

11
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 11 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

4 (max 20 pts.) | 15 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] 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 or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [/] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

15

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MMH

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	4	
	Metric 4. Habitat	6	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE	15	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: M. Martin	
Date: 3-10-21	
Affiliation: H+A	
Address: 200 Town Centre Drive, Suite 2, Rochester, NY 14623	
Phone Number: 585-321-4265	
e-mail address: mmartin@haleyaldrich.com	
Name of Wetland: MMI	
Vegetation Communit(ies): PEM	
HGM Class(es): depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See delineation report.	
Lat/Long or UTM Coordinate 39.764748 N, 83.855237 W	
USGS Quad Name Clifton	
County Greene	
Township Cedarville	
Section and Subsection	
Hydrologic Unit Code 05090202	
Site Visit 3-10-21	
National Wetland Inventory Map No	
Ohio Wetland Inventory Map Woods on Hydric Soil	
Soil Survey Greene County Soil Survey	
Delineation report/map Figure 4 of Wetland Delineation Rpt	

Name of Wetland: MMI

Wetland Size (acres, hectares): 0.1 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See delineation report.

Comments, Narrative Discussion, Justification of Category Changes:

Part of heavily used cow pasture. Drains to a small intermittent channel and south to Clark Run.

Final score : 31 **Category:** 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands.** Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies.** Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: MMI	Rater(s): M. Martin	Date: 3-10-21

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

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)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

3	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] 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)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] 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)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

20	24
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [x] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

3	27
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] 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)
- [x] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [x] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

27
subtotal this page

last revised 1 February 2001 jjm

Site: MMI	Rater(s): M. Martin	Date: 3-10-21

27
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 27 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

4 (max 20 pts.) | 31 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] 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 or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [/] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

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 generally w/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

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

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

31

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

MMI

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES (NO)	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES (NO)	If yes, Category 3
	Question 11. Relict Wet Prairies	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	20	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE	31	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

MMI

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

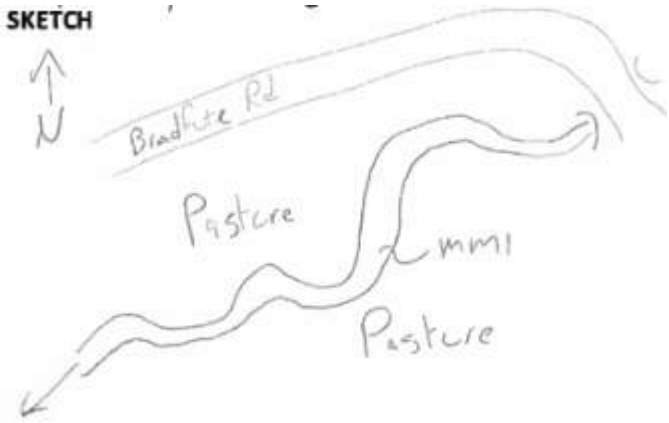
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

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MISCELLANEOUS

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Photograph Information: _____

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Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

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BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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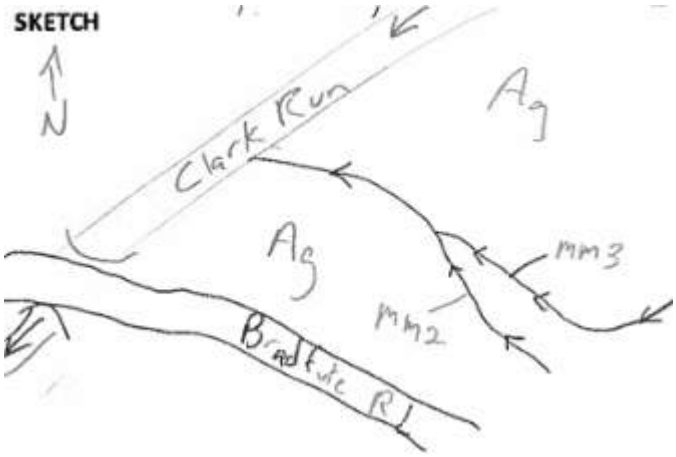
FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

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❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

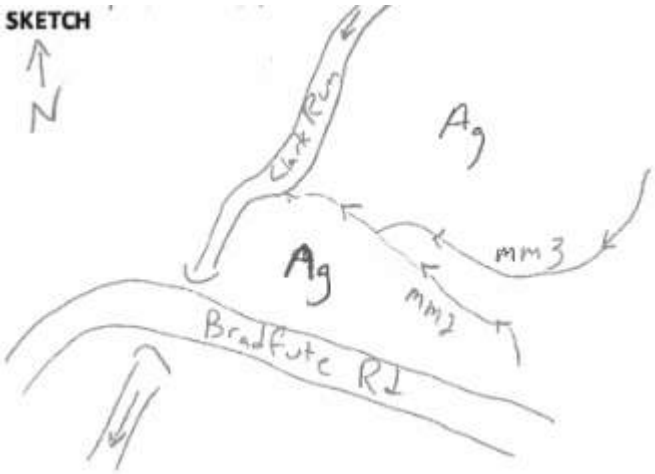
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

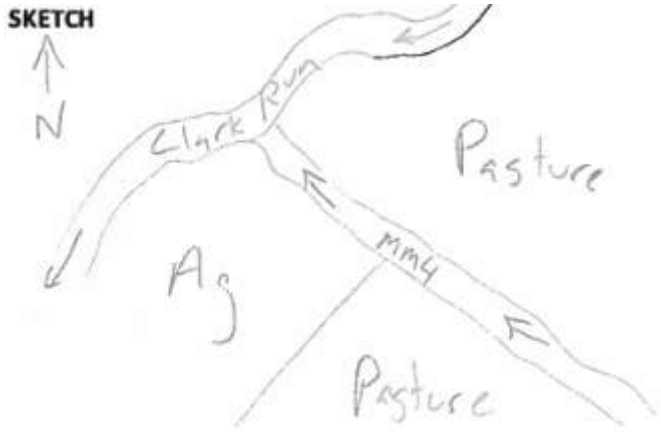
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

SKETCH

FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
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COMMENTS_____

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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

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MISCELLANEOUS

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Photograph Information: _____

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_____

Additional comments/description of pollution impacts:_____

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Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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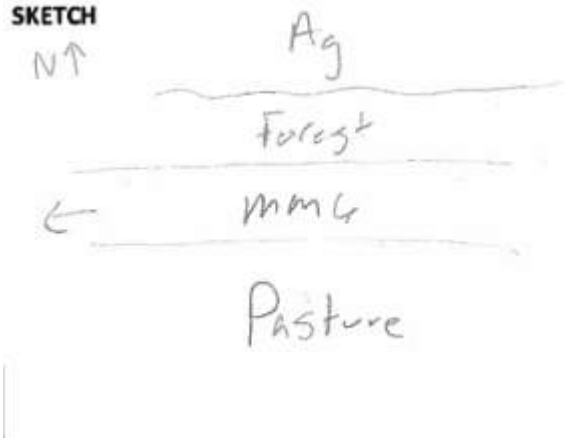
SKETCH



FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

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❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

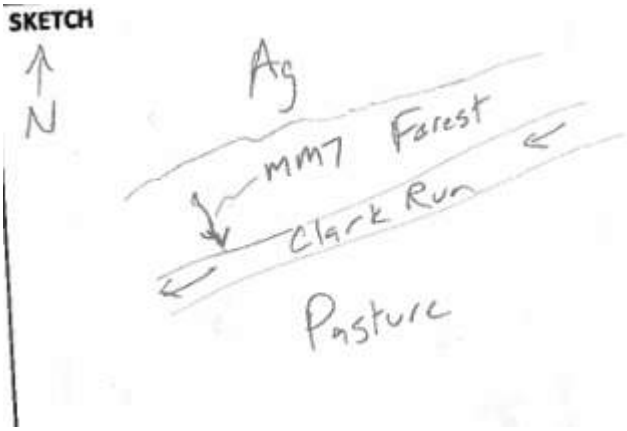
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

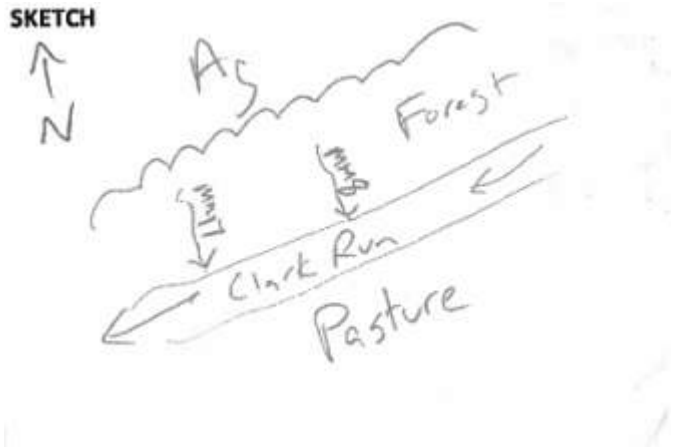
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

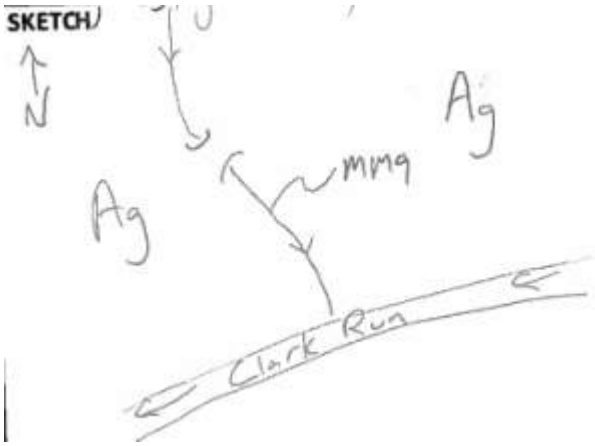
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

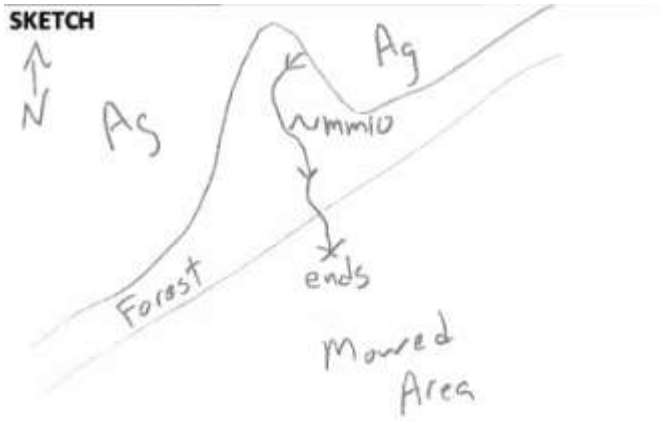
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

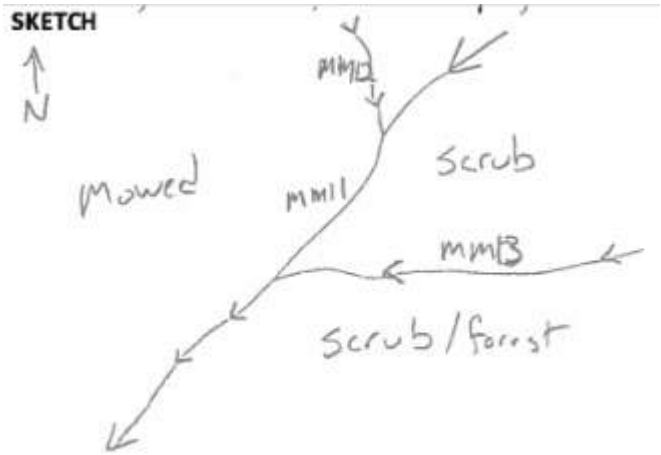
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

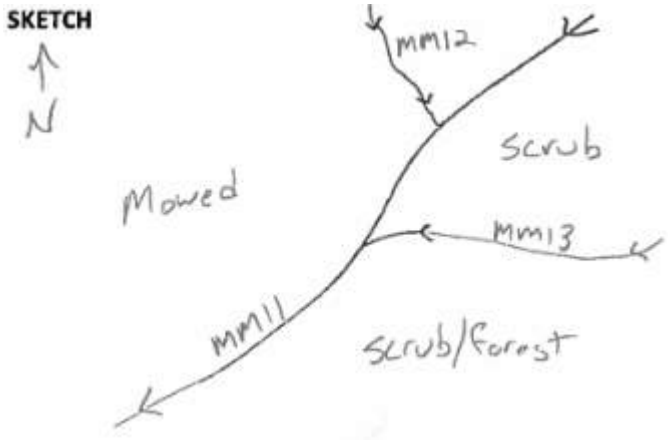
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
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❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

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_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Comments Regarding Biology: _____

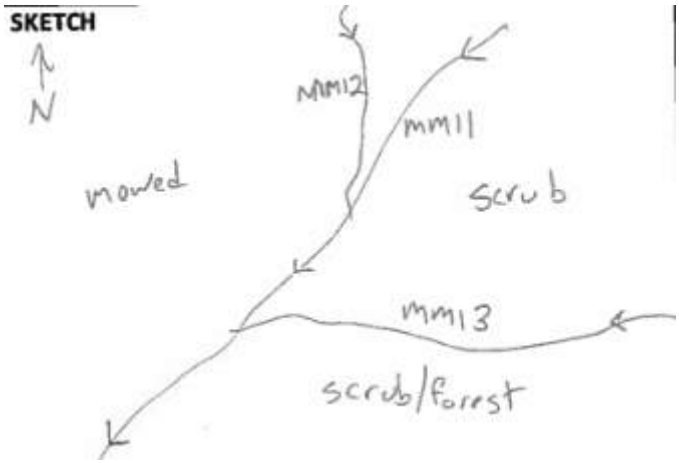
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

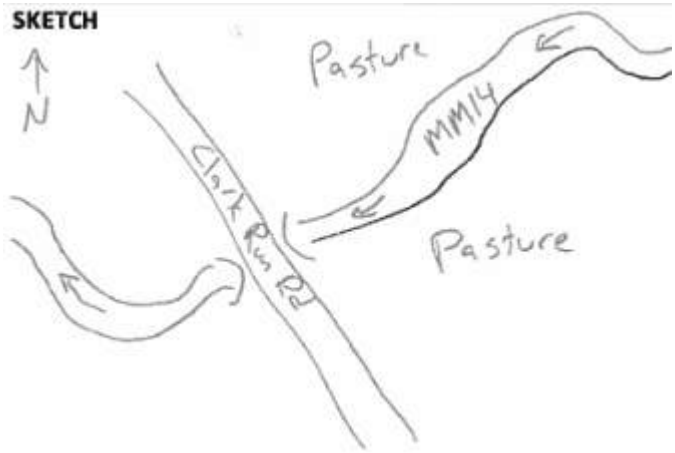
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

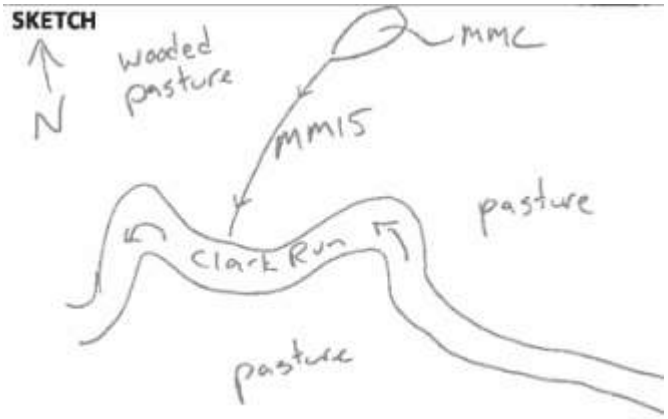
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

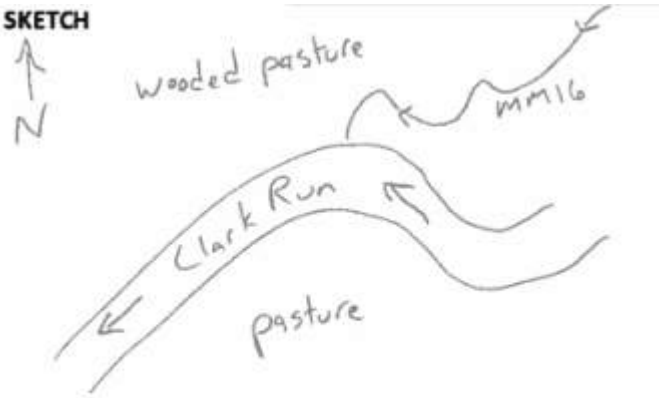
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

SKETCH



FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
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❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
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STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

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Photograph Information: _____

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_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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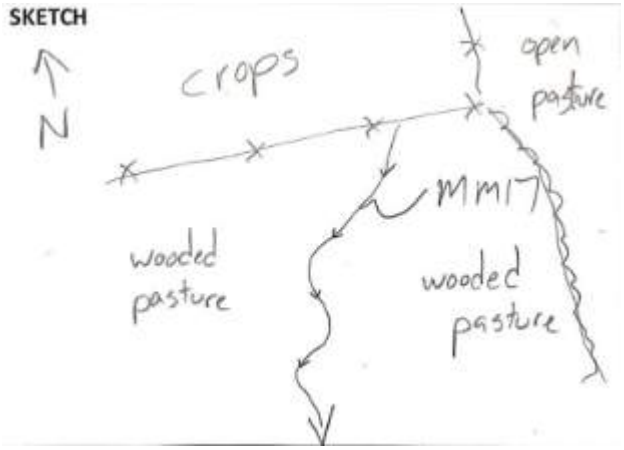
FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

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❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
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❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

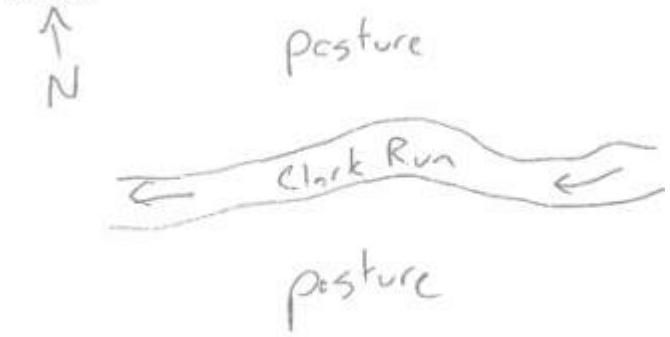
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

SKETCH



FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

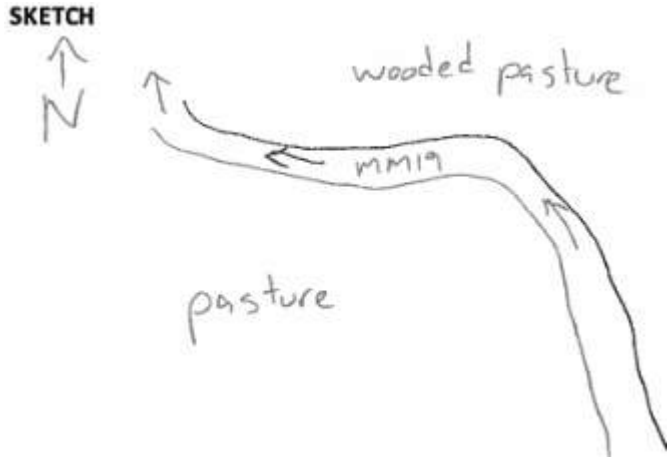
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

SKETCH



FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
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❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

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Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

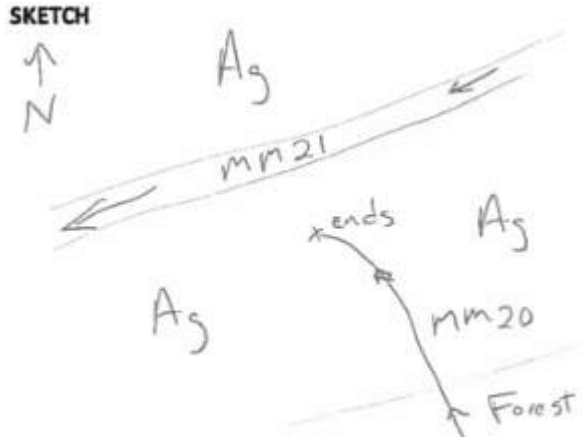
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

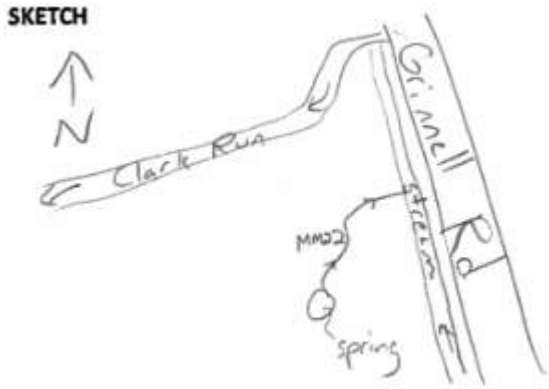
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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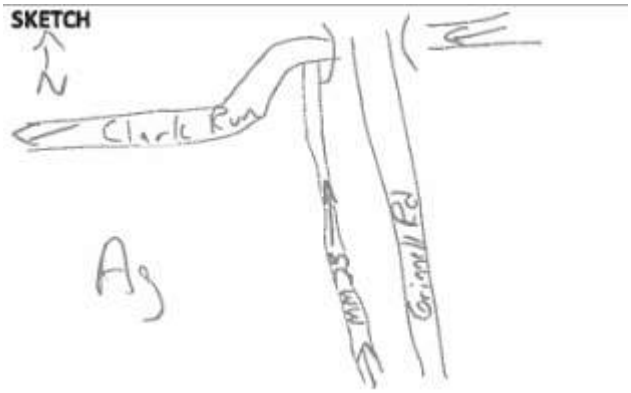
FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
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❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

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❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

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Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

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_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Comments Regarding Biology: _____

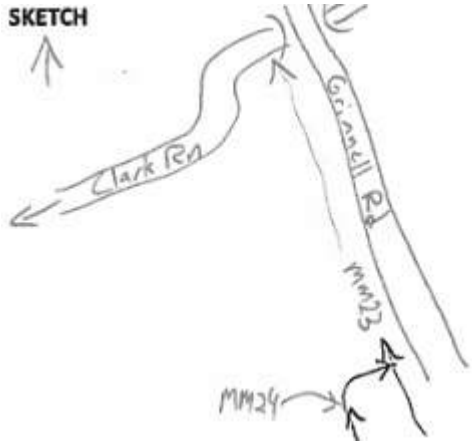
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

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TYPE		PERCENT	TYPE		PERCENT
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Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

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COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
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COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
❒	Subsurface flow with isolated pools (Interstitial)	❒	Dry channel, no water (Ephemeral)

COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

❒ CWH Name: _____ Distance from Evaluated Stream _____

❒ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

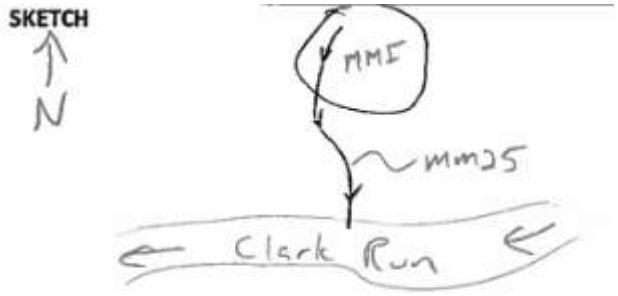
_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ❒ NONE / NATURAL CHANNEL ❒ RECOVERED ❒ RECOVERING ❒ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
❒ ❒	BLDR SLABS [16 pts]	_____	❒ ❒	SILT [3 pt]	_____
❒ ❒	BOULDER (>256 mm) [16 pts]	_____	❒ ❒	LEAF PACK/WOODY DEBRIS [3 pts]	_____
❒ ❒	BEDROCK [16 pt]	_____	❒ ❒	FINE DETRITUS [3 pts]	_____
❒ ❒	COBBLE (65-256 mm) [12 pts]	_____	❒ ❒	CLAY or HARDPAN [0 pt]	_____
❒ ❒	GRAVEL (2-64 mm) [9 pts]	_____	❒ ❒	MUCK [0 pts]	_____
❒ ❒	SAND (<2 mm) [6 pts]	_____	❒ ❒	ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: ☐ **TOTAL NUMBER OF SUBSTRATE TYPES:** ☐

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

❒	> 30 centimeters [20 pts]	❒	> 5 cm - 10 cm [15 pts]
❒	> 22.5 - 30 cm [30 pts]	❒	< 5 cm [5 pts]
❒	> 10 - 22.5 cm [25 pts]	❒	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS_____ **MAXIMUM POOL DEPTH (centimeters):** ☐

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

❒	> 4.0 meters (> 13') [30 pts]	❒	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
❒	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	❒	≤ 1.0 m (<=3' 3") [5 pts]
❒	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS_____ **AVERAGE BANKFULL WIDTH (meters):** ☐

HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ✰NOTE: River Left (L) and Right (R) as looking downstream✰

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
❒	❒	Wide >10m	❒	❒	Mature Forest, Wetland	❒	❒	Conservation Tillage
❒	❒	Moderate 5-10m	❒	❒	Immature Forest, Shrub or Old Field	❒	❒	Urban or Industrial
❒	❒	Narrow <5m	❒	❒	Residential, Park, New Field	❒	❒	Open Pasture, Row Crop
❒	❒	None	❒	❒	Fenced Pasture	❒	❒	Mining or Construction

COMMENTS_____

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

❒	Stream Flowing	❒	Moist Channel, isolated pools, no flow (Intermittent)
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COMMENTS_____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

❒	None	❒	1.0	❒	2.0	❒	3.0
❒	0.5	❒	1.5	❒	2.5	❒	>3

STREAM GRADIENT ESTIMATE

❒ Flat (0.5 ft/100 ft) ❒ Flat to Moderate ❒ Moderate (2 ft/100 ft) ❒ Moderate to Severe ❒ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ❒ Yes ❒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

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Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

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BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
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Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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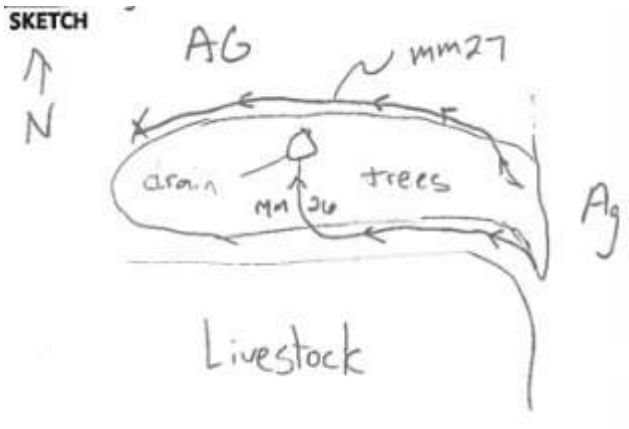
FLOW ➔



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _____

_____SITE NUMBER_____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE _____ SCORER _____ COMMENTS _____

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HHEI Metric Points

Substrate Max = 40 ☐ **A + B**

Pool Depth Max = 30 ☐

Bankfull Width Max=30 ☐

This information must also be completed

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COMMENTS_____

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DOWNSTREAM DESIGNATED USE(S)

❒ WWH Name: _____ Distance from Evaluated Stream _____

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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):_____ Date of last precipitation:_____ Quantity:_____

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N)_____ If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): _____ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

_____

_____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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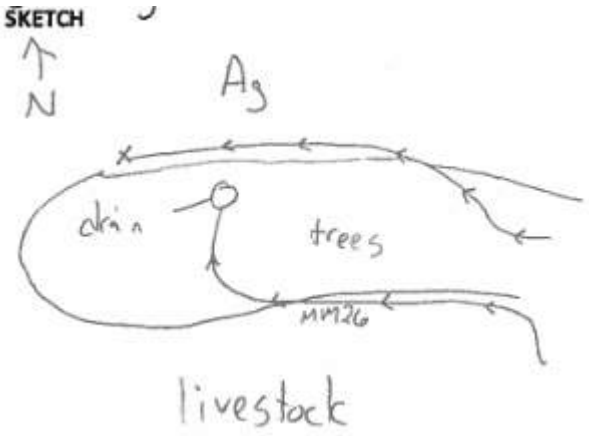
FLOW ➔



This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

4/16/2021 3:50:17 PM

in

Case No(s). 21-0117-EL-BGN

Summary: Application Appendix M (Aquatic Resource Report) electronically filed by Mr. Michael J. Settineri on behalf of Kingwood Solar I LLC