

June 3, 2022

Nashville Environmental Field Office
TDEC
711 R.S. Gass Blvd
Nashville, TN 37216

Re: Hydrologic Determination Submittal
Dickerson Flats Wetland Delineation and Hydrologic Determination

To Whom it May Concern,

Please find enclosed the "Wetlands and Hydrologic Determination Report" for the above referenced project. EnviroScience, Inc. respectfully request a verification of hydrologic determinations under the jurisdiction of the State of Tennessee. Additionally, EnviroScience requests the opportunity to accompany TDEC staff during the verification visit. Table 1 below summarizes features assessed within the project area.

Table 1. Summary of Requested Hydrologic Determination Verification

Feature		TDEC Preliminary Status*	Assessed Reach		Receiving Stream	Onsite Length (linear feet)
			Upstream Extent (lat/long)	Downstream Extent (lat/long)		
C-1	a	Stream	36.254251, -86.75589	36.254276, -86.755898	North Fork Ewing Creek	9
	b	Stream	36.254957, -86.755895	36.255744, -86.755677		4

If you have any questions or would like more information, please call EnviroScience at (330) 688-0111, or email me at AZimmerman@EnviroScienceInc.com.

Respectfully,



Andrew Zimmerman
Aquatic Biologist, QHP-IT
Enclosures

Attachment A: Wetlands Delineation and Hydrologic Determination Report
Attachment B: Property Owner Access Permission Form

Cc: Jamie Gillespie, PE, CPESC, James & Associates, jamie.gillespie@jamesplus.net

Attachment A

Wetlands Delineation and Hydrologic Determination Report

WETLAND DELINEATION AND HYDROLOGIC DETERMINATION REPORT

**Dickerson Flats, Nashville, Davidson County,
Tennessee**

Prepared for:



Mr. Jamie Gillespie
James + Associates
121 North Main Street
Dickson, TN 37055

ES Project No.: 16289

Date: May 18, 2022

Prepared by:



1722 General George Patton Dr. Suite B100
Brentwood, TN 37027
800-940-4025
www.EnviroScienceInc.com

Project: Dickerson Flats Wetland Delineation and Hydrologic Determination

Document Date: 05/18/2022

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Mr. Jamie Gillespie
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Dickson, TN 37055

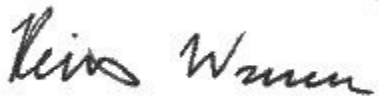
Authorization for Release

The analyses, opinions, and conclusions in this document are based entirely on EnviroScience's unbiased, professional judgment. EnviroScience's compensation is not in any way contingent on any action or event resulting from this study.

To the best of their knowledge, the undersigned attest that this document, and the information contained herein, is accurate and conforms to EnviroScience's internal Quality Assurance standards.



Andrew Zimmerman, QHP-IT
Aquatic Biologist



Reiss Warren
Wetland Scientist/Technical Reviewer



Kristen Schmidt
Editorial Reviewer

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- Figure 5. Site Map of Wetlands and Other Water Resources.
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Appendix C: Hydrologic Determination Field Data Sheets

Appendix D: Normal Weather Condition Calculation

EXECUTIVE SUMMARY

EnviroScience, Inc. performed a hydrologic determination and delineation of wetlands and other waters on May 11, 2022, for James + Associates at their Dickerson Flats site (project area). The project area consists of parcel 05000005900 located at 3551 Dickerson Pike, Nashville, Davidson County, Tennessee. The project area is approximately 4.25 acres with center coordinates at 36.254669, -86.756511. Residential properties border the project area to the north with Due West Road beyond. The eastern boundary consists of forested land. Forest, residential properties, and commercial properties exist to the south. Dickerson Pike and commercial properties are located west of the project area. The project area is residential land that consists of maintained lawn and forest and generally slopes to the north and west. The surrounding land use consists of commercial and residential land uses, forest, and Dickerson Pike.

EnviroScience understands that Nashville Metro Water Services requested that a hydrologic determination be performed on a channel located in the eastern portion of the project area. The upstream portion of the channel flows onto parcel 05000005900, located at 3551 Dickerson Pike, Nashville, Davidson County, at approximately 36.254251, -86.75589. The downstream portion of the channel flows off the parcel at approximately 36.254968, -86.755892. The channel was assessed due to a concern that a historically culverted section was not assessed prior to the installation of an approximately 248 linear foot culvert. Approximately 13 linear feet of exposed channel still exists within the project area; however, this length of channel was not sufficient to perform a hydrologic determination. To assess the channel, EnviroScience increased the length of the assessment reach to include upgradient and downgradient portions of the channel on adjacent parcels. James + Associates received verbal authorization for EnviroScience personnel to assess these offsite portions of the channel on adjacent parcels (05000006100 and 05004002000). EnviroScience does not have private landowner approval to include these offsite portions of the assessed reach in the hydrologic determination submittal for the onsite channel. Additionally, the U.S. Army Corps of Engineers (USACE), Tennessee Department of Environment & Conservation (TDEC) and Metro do not have authorization to access parcels 05000006100 or 05004002000.

The delineation results include the identification of one linear watercourse, which is discussed above. Although the assessment reaches were modified, both were determined to be streams, following TDEC guidance. Additionally, both reaches were observed to have intermittent flow according to USACE definitions. No wetlands or open water resources were identified within the project area. The maps provided in Appendix A depict the project area; representative photographs are included in Appendix B; field data sheets are provided in Appendices C; and calculations of normal weather are provided in Appendix D.

The streams described in this document are under the jurisdiction of USACE, TDEC, and/or Metro Water Services. No filling may occur in these areas without their written permission. Please contact the Nashville Environmental Field Office of TDEC at (615) 687-7000 and the Nashville District USACE Main Office at (615) 369-7500 before working in these areas.

1.0 INTRODUCTION AND SITE DESCRIPTION

EnviroScience, Inc. performed a hydrologic determination and delineation of wetlands and other waters on May 11, 2022, for James + Associates at their Dickerson Flats site (project area). The project area consists of parcel 05000005900 located at 3551 Dickerson Pike, Nashville, Davidson County, Tennessee. The project area is approximately 4.25 acres with center coordinates at 36.254669, -86.756511. Residential properties border the project area to the north with Due West Road beyond. The eastern boundary consists of forested land. Forest, residential properties, and commercial properties exist to the south. Dickerson Pike and commercial properties are located west of the project area. The project area is residential land that consists of maintained lawn and forest and generally slopes to the north and west. The surrounding land use consists of commercial and residential land uses, forest, and Dickerson Pike.

EnviroScience understands that Nashville Metro Water Services requested that a hydrologic determination be performed on a channel located in the eastern portion of the project area. The upstream portion of the channel flows onto parcel 05000005900, located at 3551 Dickerson Pike, Nashville, Davidson County, at approximately 36.254251, -86.75589. The downstream portion of the channel flows off the parcel at approximately 36.254968, -86.755892. The channel was assessed due to a concern that a historically culverted section was not assessed prior to the installation of an approximately 248 linear foot culvert. Approximately 13 linear feet of exposed channel still exists within the project area; however, this length of the channel was not sufficient to perform a hydrologic determination. To assess the channel, EnviroScience increased the length of the assessment reach to include upgradient and downgradient portions of the channel on adjacent parcels. James + Associates received verbal authorization for EnviroScience personnel to assess these offsite portions of the channel on adjacent parcels (05000006100 and 05004002000). EnviroScience does not have private landowner approval to include these offsite portions of the assessed reach in the hydrologic determination submittal for the onsite channel. Additionally, the U.S. Army Corps of Engineers (USACE), Tennessee Department of Environment & Conservation (TDEC), and Metro do not have authorization to access parcels 05000006100 or 05004002000.

The delineation results include the identification of one linear watercourse, which is discussed above. Although the assessment reaches were modified, both were determined to be streams, following TDEC guidance. Additionally, both reaches were observed to have intermittent flow according to USACE definitions. No wetlands or open water resources were identified within the project area. The maps provided in Appendix A depict the project area; representative photographs are included in Appendix B; field data sheets are provided in Appendices C; calculations of normal weather are provided in Appendix D; Hydrologic Determination Certification Metro Nashville Stormwater Division Form are provided in Appendix E; and a Community Water Determination Property Access Form is provided in Appendix F.

The project area is in the Whites Creek (HUC 051302020303) drainage basin, which drains approximately 164.6 mi² (USEPA, 2022). The project area is within the Interior Plateau ecoregion (USEPA, 2012) and is located within the area covered by the *Eastern Mountains and Piedmont Regional Supplement* (USACE, 2012) and associated plant list (Lichvar, 2016). The project area is regulated by the USACE Nashville District – West Branch Section, TDEC, and Metro Water Services.

2.0 METHODS

Government agencies regulate coastal and inland waters for commerce, flood control, and water quality. These water bodies provide numerous functions and values necessary to protect and sustain our quality of life. Wetlands comprise a significant portion of regulated waters. USACE and U.S. Environmental Protection Agency (USEPA) jointly define wetlands as:

“Those areas 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. Wetlands generally include swamps, marshes, bogs, and similar areas.”

The remaining deepwater aquatic habitats (open waters) are defined by the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) as:

“. . . areas that are permanently inundated at mean annual water depths >6.6 ft or permanently inundated areas <6.6 ft in depth that do not support rooted emergent or woody plant species.”

Wetlands were delineated using:

- *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987)
- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, Version 2.0* (2012).

Ordinary high-water marks (OHWM) defined the outermost regulatory boundaries of ephemeral and open waters.

Each sample plot and the perimeter of each wetland and other water were surveyed and marked in the field with plain pink flags and pink “wetland boundary” flags, respectively. A GPS unit with submeter accuracy was used for the survey in conjunction with aerial photography and topographic maps. Computer-Aided Design (CAD) software was used to determine wetland dimensions, and Geographic Information Systems (GIS) software was used to produce a map of the project area showing wetlands and other waters. Biologists photo-documented all resources that were encountered within the project area.

Streams were evaluated using:

- TDEC *Guidance for Making Hydrologic Determinations (HD)*, Version 1.5, to identify and locate the boundaries of stream and WWC features (TDEC, 2020).

2.1 WETLANDS

The following is a description of the wetland assessment and delineation methods.

2.1.1 Determination and Delineation

Secondary literature sources were reviewed to find known wetlands and other significant ecological resources and areas with high potential for wetlands in or near the project area. Resources included the following:

1. U.S. Geological Survey (USGS) topographic maps
2. National Wetlands Inventory (NWI) maps
3. Web Soil Survey

4. Aerial Photographs
5. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map

A field inspection of the project area was then completed to identify major plant communities and visually locate potential wetlands. A routine, onsite (Level 2) wetland determination was used to perform the delineation. Wetland communities were classified according to the classification scheme of Cowardin et al. (1979) (Table 2.1). Non-wetland communities were classified as one of the categories described in Table 2.2.

Table 2.1 Wetland Communities (Cowardin et al. 1979)

Community	Description
PEM	Palustrine Emergent
PSS	Palustrine Scrub-Shrub
PFO	Palustrine Forested
POW	Palustrine Open Water

Table 2.2 Non-Wetland Communities

Community	Description
Urban/ Maintained	Regularly maintained land; residential; industrial
Agricultural	Land used for producing crops or raising livestock; cropland; pastureland
Cleared	Disturbed areas devoid of most vegetation from recent clearing, grading, or filling
Open Field	Herbaceous community without woody vegetation
Old Field	Herbaceous community having woody vegetation coverage of <50%
Scrub-Shrub	Community dominated by woody vegetation <6 m (20 ft) tall
Forest	Community dominated by woody vegetation >6 m (20 ft) tall

Sample plots are typically established within each natural community and potential wetland. Data are recorded on Routine Wetland Determination Data forms. The following information is provided as a reference.

2.1.2 Vegetation

Four plant strata are evaluated within specific radii of the plot center to detect the presence or absence of hydrophytic vegetation. Each stratum is ranked by aerial cover in descending order of abundance. Table 2.3 provides information on each vegetative stratum.

Table 2.3 Vegetative Strata

Stratum	Definition	Survey Area
Tree	Woody plants > or equal to 3 in. (7.6 cm) diameter at breast height (dbh), regardless of height	30 ft (9.1 m) radius
Sapling/shrub	Woody plants <3 in. (7.6 cm) dbh and ≥3.28 ft (1 m) tall	15 ft (4.6 m) radius
Herbaceous	Herbs and woody plants less than 3.28 ft (1 m) in height	5 ft (1.5 m) radius
Woody vines	Woody vines >3.28 ft (1 m) in height	30 ft (9.1 m) radius

Percent dominance is obtained for each species and within each stratum. Dominant species are those that, cumulatively totaled in order of abundance, immediately exceed 50% and also include any individual species with an abundance of 20% or more (USACE, 2010). Dominant taxa are identified using recognized local guides. Nomenclature follows the *National List of Scientific Plant Names* (USDA, 1982). Following the identification of each plant species present within the plot, all dominant species within each stratum are assigned a wetland indicator status, according to Lichvar (2016). Indicators are summarized in Table 2.4.

Table 2.4 Plant Indicators

Indicator	Category	Definition
OBL	Obligate Wetland	Almost exclusively (>99% of occurrences) found in wetlands
FACW	Facultative Wetland	Most likely found in wetlands (67-99% of occurrences)
FAC	Facultative	Equally likely found in wetlands or nonwetlands (34-66%)
FACU	Facultative Upland	Most likely found in nonwetlands (1-33% occurrence in wetlands)
UPL	Obligate Upland	Almost exclusively found in nonwetlands (<1% occurrence in wetlands)

An “NI” (no indicator) designation represents species where not enough information is available to assign an indicator; an “NL” (no listing) designation is given to species whose identification is not determined sufficiently enough to assign an indicator. Once the indicator status is assigned to each dominant species, the evaluator can perform the percent dominance test according to the protocol outlined within the applicable Regional Supplement (USACE, 2010) to determine if the plot meets the criterion for hydrophytic vegetation.

2.1.3 Hydrology

Surface and subsurface hydrologic indicators are evaluated at the sample plot and throughout the adjacent community to detect the presence or absence of wetland hydrology. Primary sources of wetland hydrology include direct precipitation, headwater flooding, backwater flooding, groundwater, or any combination of these. When obtaining data from each sample plot, the evaluator observes evidence of hydrology. Primary indicators of hydrology (only one of these is necessary to indicate sufficient wetland hydrology) include the presence of surface water, water

marks, sediment deposits, drift deposits, etc. Secondary indicators of hydrology (which require two or more at each sample plot) include surface soil cracks, drainage patterns, crayfish burrows, etc. (USACE, 2010).

2.1.4 Soils

The upper horizons of the soil at each sample plot are examined to detect the presence or absence of hydric soils indicators. Current USACE guidance requires the evaluator to assess the upper 20 inches of soil for hydric soil characteristics. Most indicators of hydric soils require an assessment of soil matrix color and mottle characteristics (Environmental Laboratory, 1987; USACE, 2010) for each horizon. These characteristics are determined by comparing a moist sample with the *Munsell Soil Color Chart* (Munsell Color, 2009) or *The Globe Soil Color Book* (Visual Color Systems, 2004).

2.1.5 Cowardin Wetland Classification

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory uses the *Classification of Wetlands and Deepwater Habitats of the United States* to classify wetland habitat types (Cowardin et al., 1979). This classification system is hierarchical and defines five major systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine.

2.2 OTHER WATERS

Other waters include ephemeral and open waters. These waters are further subdivided into two categories: 1) ponds and lakes; and 2) streams and rivers.

2.2.1 Ponds and Lakes

Palustrine systems other than wetlands and lacustrine waters are addressed as ponds and lakes, respectively. These non-linear open waters may harbor important aquatic communities such as vegetated shallows (aquatic beds) and mudflats. They are classified according to Cowardin et al. (1979).

2.2.2 Streams and Rivers

Riverine systems are linear flowing waters bounded by a channel. Cowardin et al. (1979) divide these systems into four groups; however, for this report, streams are placed into one of the three regulatory types listed below.

Ephemeral: An ephemeral stream only conveys runoff precipitation and meltwater. It is permanently located above the water table and is most often dry.

Intermittent: An intermittent stream is located below the water table for parts of the year but does have dry periods.

Perennial: A perennial stream typically has flowing water throughout the entire year.

2.2.3 Hydrologic Determinations

The State of Tennessee requires a certified Hydrologic Professional to identify Waters of the State and defines Waters of the State as streams. All other linear features are defined as a “wet weather conveyance” (WWC).

A WWC means, notwithstanding any other law or rule to the contrary, artificial or natural watercourses, including natural watercourses that have been modified by channelization:

1. That flow only in direct response to precipitation runoff in their immediate locality.
2. Whose channels are at all times above the groundwater table.

3. That are not suitable for drinking water supplies.
4. In which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow, there is not sufficient water to support fish or multiple populations of obligate lotic aquatic organisms whose life cycles includes an aquatic phase of at least two months.

Stream and hydrologic determinations were performed using the TDEC *Guidance for Making Hydrologic Determinations (HD), Version 1.5*, to identify and locate the boundaries of stream and WWC features (TDEC, 2020). EnviroScience biologist Andrew Zimmerman, Qualified Hydrologic Professional – In-Training (QHP-IT), performed hydrologic determinations.

EnviroScience established the survey area of the watercourses along the property extent and fixed locations using a GPS unit with submeter accuracy. The water features were then assessed using the previously mentioned methodologies. Biologists photo-documented all resources encountered within the assessed survey area.

3.0 LITERATURE REVIEW

The following sections detail background information on the project area and further explain the maps located in Appendix A.

3.1 USGS TOPOGRAPHIC MAP

The USGS 7.5-minute topographic series map of the project area (Whites Creek Quadrangle) is presented in Figure 2 (Appendix A). The project area consists of a small valley to the east and the lower elevations of a ridge to the west. One structure is depicted near the middle of the project area, and a closed depression is depicted within the valley. No streams, wetlands, or open water resources are depicted within the project area. Elevation within the project area is approximately 590 feet above mean sea level (AMSL) to 610 feet AMSL.

3.2 NATIONAL WETLANDS INVENTORY MAP

The NWI map (Whites Creek Quadrangle) of the project area is presented in Figure 3 (Appendix A). No streams, wetlands, or open water resources are depicted within the project area. An unknown perennial, unconsolidated bottom, permanently flooded riverine (R5UBH) system is located to the north of the project area and was identified as the receiving stream for C-1.

3.3 COUNTY SOIL SURVEY

The project area is found on the *Soil Survey of Davidson County, Tennessee*, and was accessed in the Soil Survey Geographic (SSURGO) Database (USDA Web Soil Survey, 2021) (Figure 4, Appendix A). Three soil types were identified within the project area. The onsite soils are summarized in Table 3.1 below.

Table 3.1 Soil Types Mapped in the Project Area

Symbol	Soil Name	Status	Common Landform	Percent Hydric	Acres in Project Area	Percent in Project Area
Ln	Lindell-Urban land complex	Not Hydric	-	0	0.201	7.8
MmC	Mimosa silt loam, 5 to 12 percent slopes, eroded	Not Hydric	Hillsides on basins	0	1.460	56.5
MrE	Mimosa-Rock outcrop complex, 20 to 40 percent slopes	Not Hydric	Escarpments on basins	0	2.584	100.0

3.4 AERIAL PHOTOGRAPHY

A recent aerial photograph of the project area is presented in Figure 5 (Appendix A). The project area is depicted within a residential and commercial setting with Due West Road in the surrounding area to the north and Dickerson Pike adjacent to the west of the project area. A residential home is shown near the middle of the project area, and a barn is depicted near the eastern boundary. The adjacent property to the east is composed of forest. Forest, residential properties, and commercial properties exist to the south. Dickerson Pike and commercial properties are located west of the project area.

3.5 FEMA FLOOD INSURANCE RATE MAP

FEMA produces Flood Insurance Rate Maps (FIRMs), which show the locations of predictable floodplain during precipitation flood events. The FIRM of the project area is included in Appendix A (Figure 6). The project area is not depicted within a FEMA 100-year flood zone; however, a 100-year flood zone is shown to the north and west.

4.0 RESULTS AND DISCUSSION

The wetland delineation and hydrologic determination were conducted May 11, 2022 under elevated weather conditions. One linear watercourse was identified and assessed during the site visit. No wetlands or open water aquatic resources were identified.

4.1 WETLANDS

No wetlands were identified within the project area.

4.2 STREAM AND WET WEATHER CONVEYANCE

Due to overlapping state and federal agency regulatory authorities, a watercourse can be considered a stream, a WWC, or both stream and WWC. Section 4.2 discusses the linear watercourses identified within the project area.

One linear watercourse was identified within the project area. Stream and WWC assessment results are summarized in Table 4.1. Locations of the assessed linear watercourses are depicted in Figure 5 (Appendix A). Representative photographs are included in Appendix B, and TDEC

Hydrologic Determination Field Data Sheets are provided in Appendix C. Data sheet scoring forms document the primary and secondary field indicator evaluations. Secondary field indicator evaluation observations include information on stream geomorphology, hydrology, and biology. Normal weather condition calculations are provided in Appendix D.

Table 4.1 Hydrologic Determination and Stream Assessment Results

Feature		TDEC Preliminary Status*	USACE Preliminary Status*	Assessed Reach		Receiving Stream	Onsite Length (linear feet)
				Upstream Extent (lat/long)	Downstream Extent (lat/long)		
C-1	a	Stream	INT	36.254251, -86.75589	36.254276, -86.755898	North Fork Ewing Creek	9
	b	Stream	INT	36.254957, -86.755895	36.255744, -86.755677		4
Total Stream (linear feet)							13
Total Watercourse (linear feet)							13

* INT = intermittent stream

C-1 scored as a stream following TDEC guidance and has intermittent flow. C-1a reach was identified as a stream using primary and secondary indicators. The reach had the “presence of multiple populations of obligate lotic organisms with >2 month aquatic phase,” which included stoneflies, caddisflies, and amphipods, a primary indicator for a stream. Additionally, secondary indicators were scored as supporting evidence, confirming the reach as a stream. C-1b also showed evidence of a primary stream indicator, “presence of fish (except *Gambusia*).” A disjunct pool within the assessment reach contained multiple Rosyside Dace, a headwater species of fish.

4.3 PONDS AND LAKES

No open water aquatic resources were identified within the project area.

5.0 REGULATORY JURISDICTION

The streams described in this document are under the jurisdiction of USACE, TDEC, and/or Metro Water Services. No filling may occur in these areas without their written permission. Please contact the Nashville Environmental Field Office of TDEC at (615) 687-7000 and the Nashville District USACE Main Office at (615) 369-7500 before working in these areas.

6.0 ASSUMPTIONS AND DISCLAIMERS

The constant influence of human activity on the project area can result in a rapid change of ecological boundaries. Over time, natural succession and changes in hydrology can also affect their boundaries. The precision of GPS collected data is subject to variation caused by canopy cover, atmospheric interference, and satellite configuration. Because slight inaccuracies are possible, all acreages and derived boundaries presented in this report are approximate.

The results and conclusions in this report apply to the year and date in which the data were collected. This report is not considered officially valid until USACE approves it. The report is then valid for five years. Refer to the USACE Regulatory Guidance Letter #94-1 (May 23, 1994).

7.0 REFERENCES

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. (1979). Classifications of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Department of Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.
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- Tennessee Department of Environmental Conservation. (2020). Guidance for Making Hydrologic Determinations, Version 1.5. Tennessee Department of Environment and Conservation, Division of Water Pollution Control. Nashville, TN
- U.S. Army Corps of Engineers. (1994). Regulatory Guidance Letter 94-01. Expiration of Geographic Jurisdictional Determinations.
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- U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. (2007). U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. Washington, D.C.
- U.S. Department of Agriculture, Soil Conservation Service. (1982). National List of Scientific Plant Names. 1. List of plant names; 2. Synonymy SCS-13 General Notes and Selected References TP-159. U.S. Department of Agriculture, Washington, DC: 416- 438.
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- U.S. Geological Survey. (2019). StreamStats. Retrieved from <https://streamstats.usgs.gov/ss/>
- Visual Color Systems. (2004). The Globe Soil Color Book. Mountindale, New York.

Appendix A

Project Maps

Figure 1. Location of Site on Highway Map of Davidson County, Tennessee.

Figure 2. USGS 7.5-minute Map of the Whites Creek Quadrangle.

Figure 3. NWI Map of Site (Whites Creek Quadrangle).

Figure 4. Soil Map of Site in Davidson County, Tennessee.

Figure 5. Site Map of Wetlands and Other Water Resources.

Figure 6. FEMA Flood Insurance Map.

Path: C:\Users\Anna Giordano\Desktop\GIS_Projects\UJames + Associates\16289_Dickerson Flats Wetland Delineation and HD\Map1_Location.mxd
Date: 5/6/2022

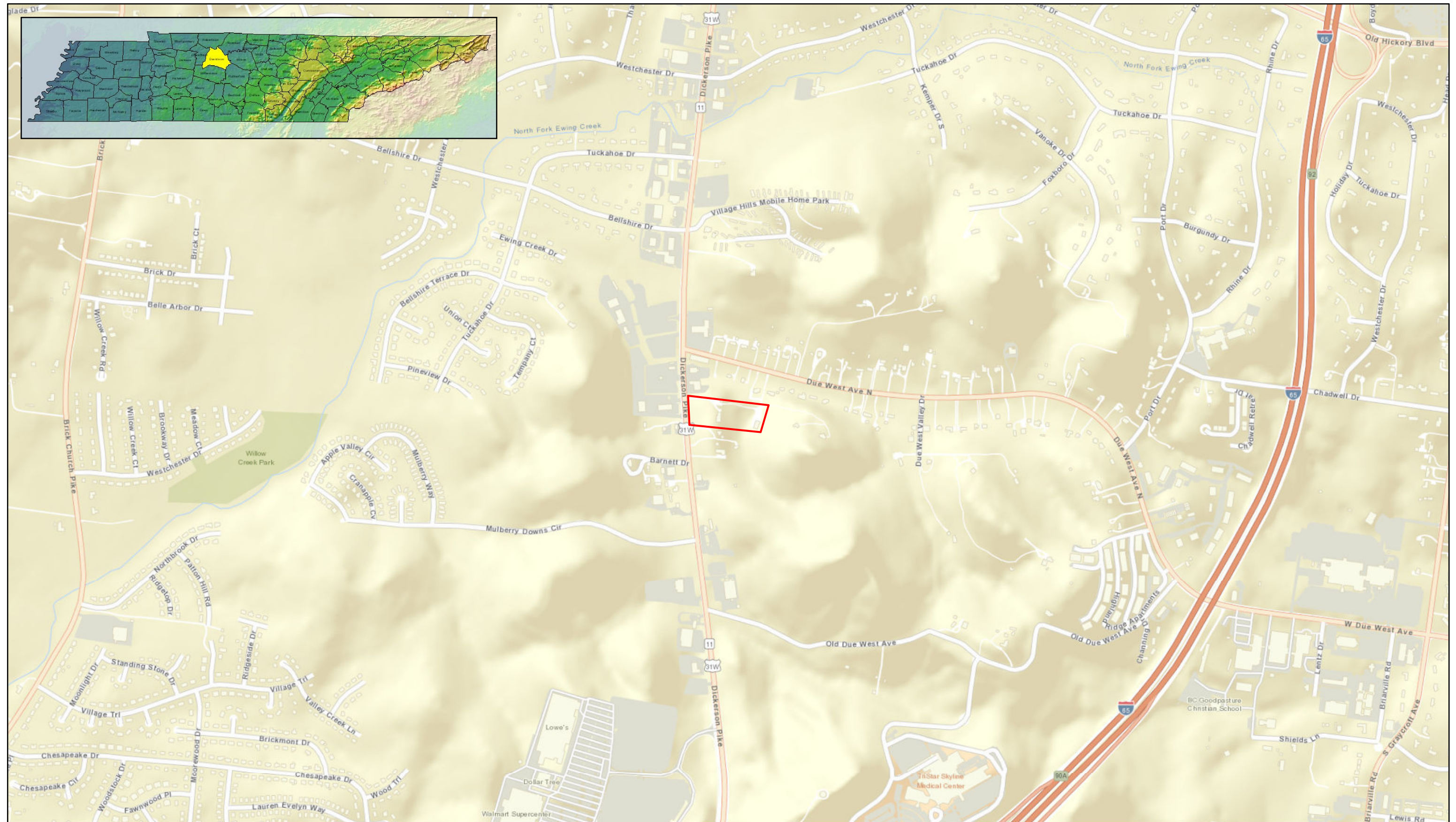
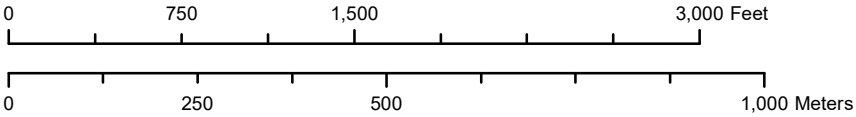


Figure 1. Location of Site on Highway Map of Davidson County, Tennessee. Dickerson Flats Wetland Delineation and Hydrologic Determination.

 Project Area

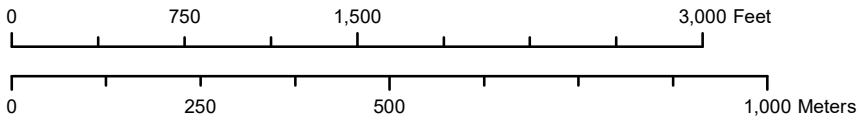


Date: 5/6/2022 Path: C:\Users\Anna Giordano\Desktop\GIS_Projects\UJames + Associates\16289_Dickerson Flats Wetland Delineation and HD\Map2_Topo.mxd



Figure 2. USGS 7.5-minute Topographic Map of Whites Creek Quadrangle. Dickerson Flats Wetland Delineation and Hydrologic Determination.

 Project Area



Date: 5/6/2022 Path: C:\Users\Anna Giordano\Desktop\GIS_Projects\UJames + Associates\16289_Dickerson Flats Wetland Delineation and HD\Map3_NWI.mxd

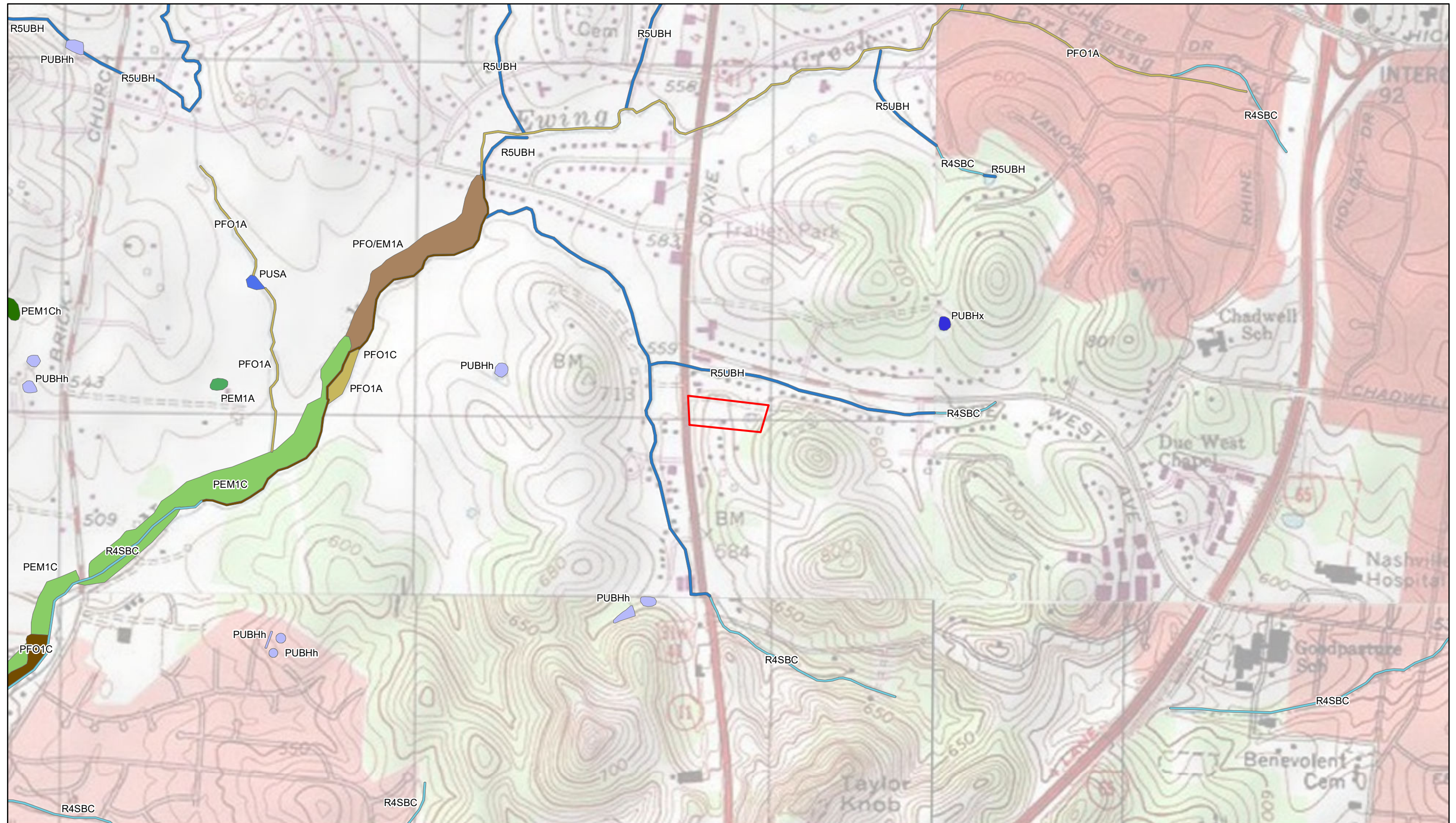
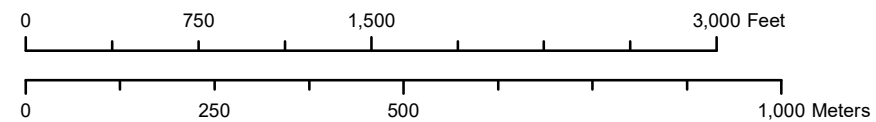


Figure 3.
NWI Map of Site (Whites Creek Quadrangle).
Dickerson Flats Wetland Delineation
and Hydrologic Determination.

 Project Area



Date: 5/6/2022 Path: C:\Users\Anna Giordano\Desktop\GIS_Projects\UJames + Associates\16289_Dickerson Flats Wetland Delineation and HD\Map4_Soil.mxd



Figure 4. Soil Map of Site
in Davidson County, Tennessee.
Dickerson Flats Wetland Delineation
and Hydrologic Determination.

 Project Area

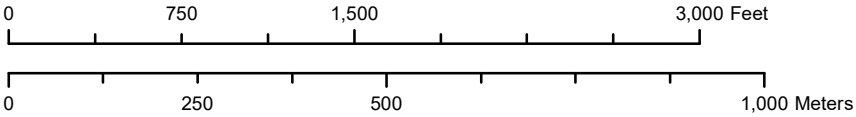
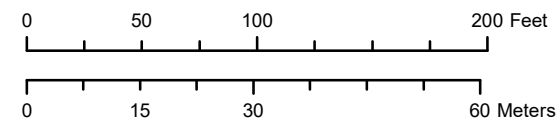




Figure 5. Site Map of Wetlands and Other Water Resources. Dickerson Flats Wetland Delineation and Hydrologic Determination.

- Culvert
- Culverted Stream
- Intermittent Stream
- Project Area



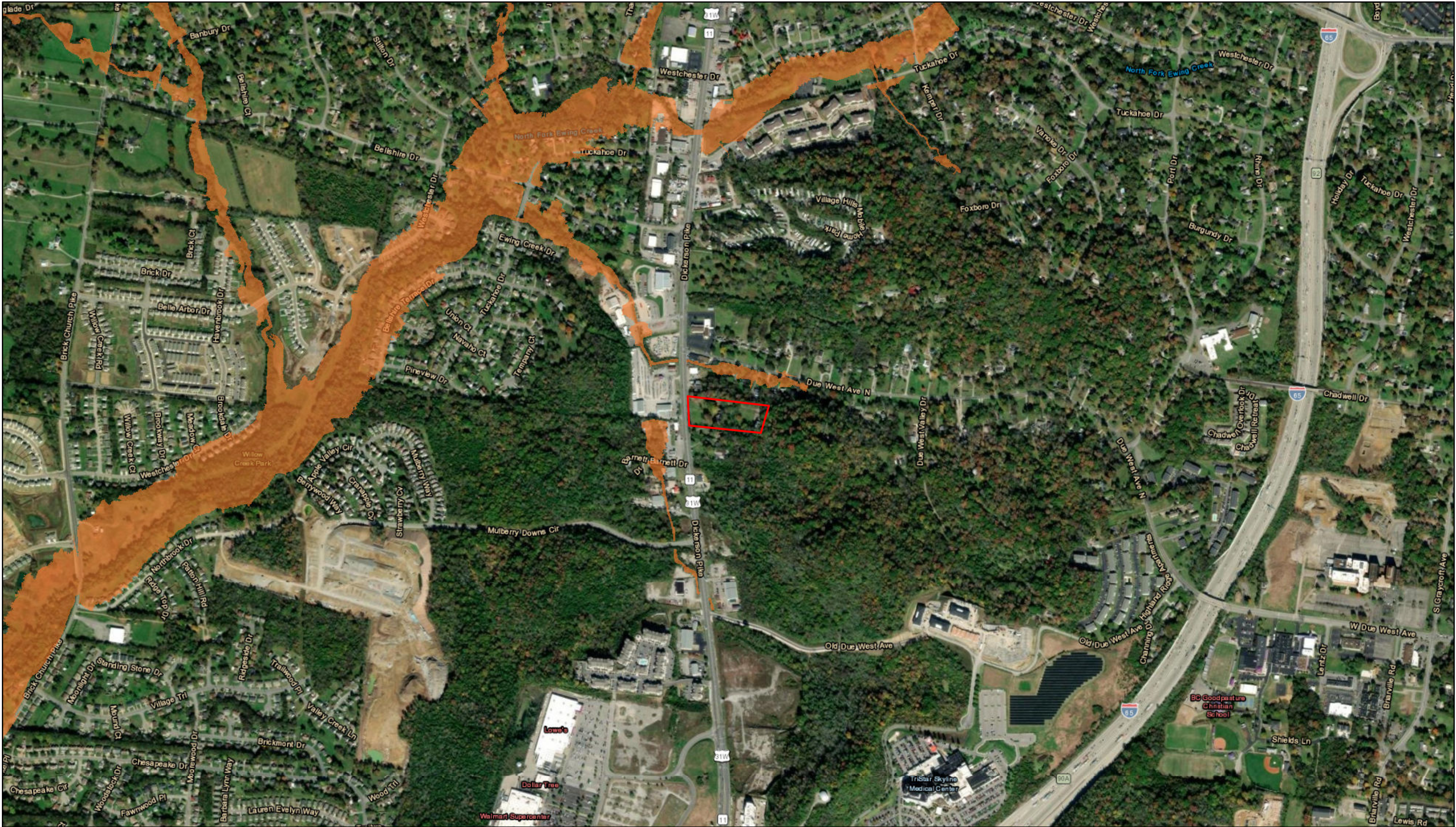
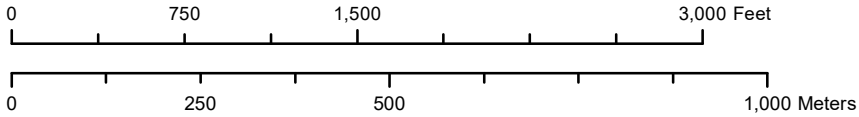


Figure 6. FEMA Map of Site
in Davidson County, Tennessee.
Dickerson Flats Wetland Delineation
and Hydrologic Determination.

- 100-Year Flood Zone
- Project Area



Appendix B

Site Photographs

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 1. Representative photo of maintained lawn, facing southeast.



Photo 2. Photo of upland vegetation within the southern boundary of the project area, facing southwest.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 3. Representative photo of western portion of the project area showing maintained lawn, facing southeast.



Photo 4. Representative photo of western portion of the project area showing maintained lawn, facing northeast.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 5. Representative photo of western portion of the project area showing maintained lawn, facing northwest.



Photo 6. C-1a lower extent, showing culvert inlet and dry channel, facing south.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 7. C-1a showing channel with isolated pools of water, facing south.



Photo 8. C-1a channel upper extent showing additional isolated pools, facing south.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 9. Representative stonefly from C-1a reach.



Photo 10. Representative photo of case building caddisflies within C-1a reach.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 11. Upstream extent of C-1b, showing perched outflow culvert, facing south.



Photo 12. C-1b channel mid-reach, facing north.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 13. C-1b channel mid-reach, facing north.



Photo 14. Isolated pool with live and dead Rosyside Dace within C-1b reach.

Dickerson Flats Wetland Delineation and Hydrologic Determination
Photographed May 13, 2022



Photo 15. C-1b lower extent at confluence with perennial stream, facing north.

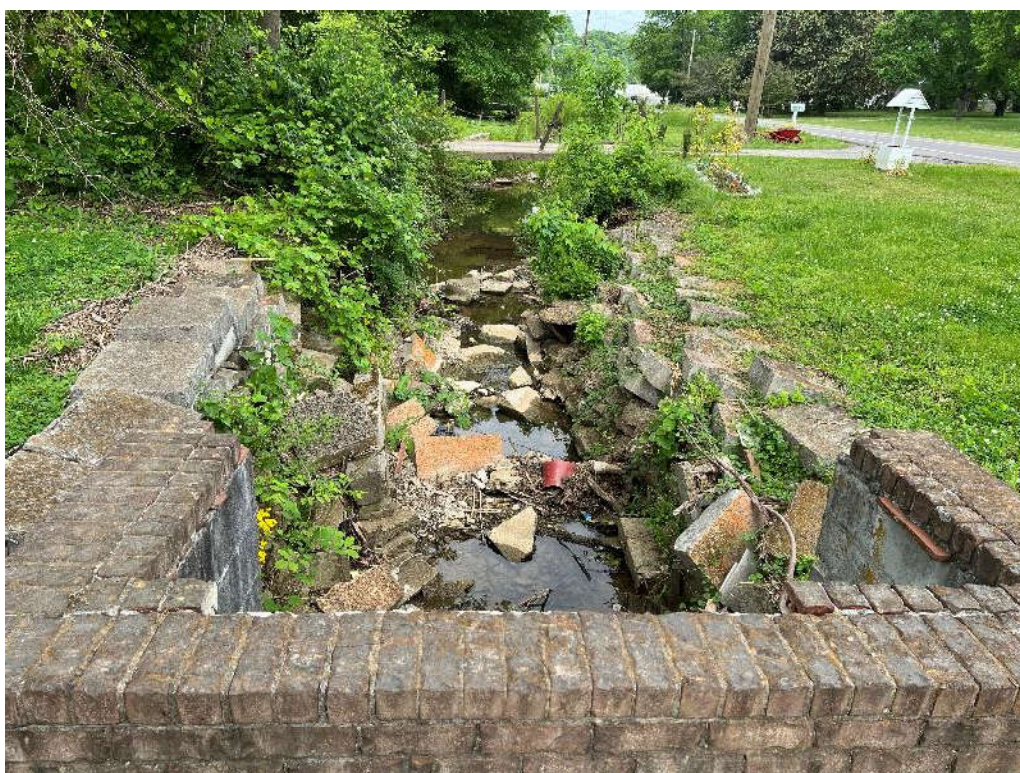


Photo 16. Representative photo of C-1 receiving stream, facing west.

Appendix C

Hydrologic Determination Field Data Sheets

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	North Fork Ewing Creek	Date/Time:	5/11/2022
Assessors/Affiliation:	Andrew Zimmerman/EnviroScience, Inc.	Project ID:	
Site Name/Description:	Dickerson Flat/ C-1a		
Site Location:	Nashville, TN		
HUC (12 digit):	51302020303	Lat/Long:	
Previous Rainfall (7-days):	0.31in	36.254251, -86.75589	
Precipitation this Season vs Normal:	abnormally wet elevated <u>average</u> low abnormally dry unknown		
Source of recent & seasonal precip data:			
Watershed Size:	0.03mi ²	County:	Davidson
Soil Type(s)/Geology:	MmC, MrC	Source:	SoilWeb
Surrounding Land Use:	Urban, Residential, Forest		
Degree of historical alteration to natural channel morphology & hydrology (circle one):			
<div style="display: flex; justify-content: space-around; width: 100%;"> <u>Severe</u> Moderate Slight Absent </div>			

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic features exists solely due to a process discharge		WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species		WWC
3. Watercourse dry anytime during February through April 15h, under normal precipitation/groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with > 2 month aquatic phase		<u>Stream</u>
6. Presence of fish (except <i>Gambusia</i>)		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance for Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =	Stream
Secondary Indicator Score (if applicable) =	22

Justification / Notes:

Assessing segment of channel which was historically culverted. An assessment was performed upstream and downstream of the culverted section of channel in order to assess the historically culverted section of channel. Upstream of the culverted section there was the presence of multiple populations of obilgate macros including stoneflies, caddisflies, and amphipods. At the time of the assessment channel flow was restricted to isolated pools, indicating the channel has intermittent flow. Secondary metrics assessed for support of primary indicator.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional Bars or benches	0	1	2	3
7. Braided Channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade Controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 5.5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel ¹	3	2	1	0
21. Rooted upland plants in thalweg ¹	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel ²	0	0.5	1	1.5

¹ Focus is on the presence of terrestrial plants.

² Focus is on the presence of aquatic or wetland plants

Total Points = <u>22</u> Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score <19 points

Notes:

Frog = 1
 Stonefly = 6
 Caddisflies = 16
 Amphipods = 3

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	North Fork Ewing Creek	Date/Time:	5/11/2022
Assessors/Affiliation:	Andrew Zimmerman/EnviroScience, Inc.	Project ID:	
Site Name/Description:	Dickerson Flat/ C-1b		
Site Location:	Nashville, TN		
HUC (12 digit):	51302020303	Lat/Long:	
Previous Rainfall (7-days):	0.31in		36.254957, -86.755895
Precipitation this Season vs Normal:	abnormally wet elevated <u>average</u> low abnormally dry unknown		
Source of recent & seasonal precip data:			
Watershed Size:	0.04mi ²	County:	Davidson
Soil Type(s)/Geology:	MmC, MrC	Source:	SoilWeb
Surrounding Land Use:	Urban, Residential, Forest		
Degree of historical alteration to natural channel morphology & hydrology (circle one):			
<div style="display: flex; justify-content: space-around; width: 100%;"> <u>Severe</u> Moderate Slight Absent </div>			

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic features exists solely due to a process discharge		WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species		WWC
3. Watercourse dry anytime during February through April 15h, under normal precipitation/groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with > 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i>)		<u>Stream</u>
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance for Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =	Stream
Secondary Indicator Score (if applicable) =	0

Justification / Notes:

Assessing segment of channel which was historically culverted. An assessment was performed upstream and downstream of the culverted section of channel in order to assess the historically culverted section of channel. Downstream of the culverted section fish were observed in isolated pools. Isolated pools indicate the channel has intermittent flow. Channel flows into second order stream which exhibits perennial flow and fish.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional Bars or benches	0	1	2	3
7. Braided Channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade Controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel ¹	3	2	1	0
21. Rooted upland plants in thalweg ¹	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel ²	0	0.5	1	1.5

¹ Focus is on the presence of terrestrial plants.

² Focus is on the presence of aquatic or wetland plants

Total Points = <u>0</u> Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score <19 points

Notes:

Appendix D

Normal Weather Conditions Calculation

Calculation of Normal Weather Conditions

		Long-term rainfall records								
	Month	Standard Deviation	Minus One Std. Dev. (DRY)	Normal (Mean inches)	Plus One Std. Dev. (WET)	Actual Rainfall	Condition (elevated, low, average)	Condition value	Month weight value	Product of previous two columns
1st prior month	April	2.10	2.51	4.61	6.71	6.04	Average	2	x 3	6
2nd prior month	March	2.34	2.97	5.31	7.65	3.96	Average	2	x2	4
3rd prior month	February	2.24	2.16	4.40	6.64	10.26	Elevated	3	x1	3
									Sum =	13

Note:

If sum is:	
6-9	Then prior period has been drier than normal
10-14	Then prior period has been normal
15-18	Then prior period has been wetter than normal

Condition Value	
Low =	1
Average =	2
Elevated =	3

Conclusions:

For channels assessed on 5/11/22, conditions were average for the 3-month period.

Attachment B

Property Owner Access Permission Form



Community Water Determination Property Access

This form grants permission for a qualified professional to perform a community water determination on my property. The results of this determination will be submitted to Metro Water Services (MWS) staff for review and used to assess whether Metro's water quality buffer criteria (per Section 6.9 of [Vol. 1 of the Metro Stormwater Management Manual](#)) would be applicable to the water feature/conveyance in question. Water quality buffers protect community waters by establishing a no disturb area adjacent to them. The results of the determination will be entered into Metro's permit tracking database and be attached to the parcel. This determination will not assess if an Aquatic Resources Alteration Permit is required from the Tennessee Department of Environment and Conservation (TDEC) or if a channel is a Waters of the United States per the Army Corps of Engineers (Corps). Please submit the completed form to Rebecca Dohn (Rebecca.dohn@nashville.gov or fax 615-880-2425).

I, Tony Woodham (owner name) hereby authorize _____ (qualified professional) to enter my property and perform a hydrologic determination.

Property Owner Information:

Sign Name: 

Print Name: Tony Woodham

Date: MAY 16, 2022

Email address: twoodham@woodbinecommunity.org

Phone Number: 615-833-9580

Property Address: 3551 Dickerson Pike

Nashville, TN 37207

Standard Parcel Number: 05000005900

Qualified Professional:

Name / Company: _____

Email Address / Phone Number: _____

Because natural variation and human activities can alter hydrologic conditions, MWS reserves the right to reassess the classification of this watercourse in the future. Please contact Rebecca Dohn at (615) 880-2420 with questions or for additional information.