Appendix A – Correspondence and Supporting Information

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RESOLUTION NO. _____

A RESOLUTION TO AMEND THE TEXT OF THE METROPOLITAN LYNCHBURG AND MOORE COUNTY ZONING ORDINANCE ESTABLISHING REGULATIONS FOR SOLAR ENERGY SYSTEMS AS PERMITTED USE IN THE A-1 – AGRICULTURE-FORESTRY DISTRICT AND ESTABLISHING REGULATIONS GOVERNING THE DEVELOPMENT OF SOLAR ENERGY SYSTEMS

WHEREAS, pursuant to Tennessee Code Annotated § 13-7-101 and § 13-7-102, a zoning ordinance and map have been adopted by The Metropolitan Government of Lynchburg, Moore County, Tennessee; and

WHEREAS, the Planning Commission of the Metropolitan Government of Lynchburg, Moore County, Tennessee has recommended that the following described amendments be made in the text of the adopted zoning ordinance; and

WHEREAS, pursuant to Tennessee Code annotated § 13-3-403(c), a public notice was published at least fifteen (15) days prior to the meeting.

NOW, THEREFORE, BE IT RESOLVED by the Council of the Metropolitan Government of Lynchburg, Moore County, Tennessee as follows:

1. **Definitions.** Section 2.020 shall be amended to include the following definitions.

   Solar Energy System ("SES") means a device or structural design feature that provides for the collection of solar energy for electricity generation, consumption, or transmission or for thermal application. For purposes of this section, SES refers only to (1) photovoltaic SESs that convert solar energy directly into electricity through a semiconductor device, or (2) solar thermal systems that use collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling. SES includes all components of the electricity generating facility (inverters, transformers, switchgear, substations, communications infrastructure, and other ancillary or related equipment), but does not include transmission lines or generation tie lines connecting the SES to a utility-owned substation.

   Ground Mounted Solar Energy System ("GSES") means an SES that is structurally mounted to the ground and does not qualify as an Integrated Solar Energy System (ISES). For purpose of this section, any solar canopy that does not qualify as an ISES shall be considered a GSES, regardless of where it is mounted.

2. **SES Standards.** The following shall be inserted as Section 4.140:

Section 4.140. Development Standards for Ground Mounted Solar Energy Systems ("GSES")

A GSES must conform to the following development standards:

A. Fence. A GSES shall be enclosed by perimeter fencing of at least six (6) feet in height.

B. Setback. A GSES shall be set back from all property lines at least eighty (80) feet, unless a lesser setback is approved by the Board of Zoning Appeals as a variance, and at least two hundred fifty (250) feet from all residential dwelling units occupied at the time of site plan review.

C. Landscape Buffering. A sixty (60) foot vegetative buffer is required to the extent necessary to screen the GSES from the view of adjacent residential structures, future residential structures for which a building permit has been obtained as of the date the building permit application for the GSES is submitted pursuant to Section 7.030(A), and public rights of way. Such buffer shall be planted with evergreen or other suitable plantings to include existing growth and vegetation and used for no other purpose.

D. Signage. A GSES shall have signs (a) stating the risks that may result from contact with a GSES, (b) identifying the owner or operator of the GSES, (c) providing a 24-hour emergency contact phone number, and (d) at the option of the developer of a GSES, containing educational information about the GSES. All signs displayed with respect to a GSES shall comply with the requirements of the applicable zoning district for displaying advertisements.

E. Decommissioning. Unless otherwise approved by the Board of Zoning Appeals, decommissioning of a GSES shall begin no later than twelve (12) months after a GSES has permanently ceased to generate electricity, and the owner or operator of the GSES shall return the property to its condition prior to the installation of the GSES or to some other condition reasonably appropriate for the designated land use within twenty-four (24) months after a GSES has permanently ceased to generate electricity. Notwithstanding anything to the contrary, a GSES will not be considered to have permanently ceased to generate electricity unless it has failed to diligently pursue the production of, or restoration of the GSES's ability to produce, electricity for at least six (6) consecutive months. A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. The plan shall include provisions for removal of all structures, foundations, electrical equipment and internal or perimeter access roads, restoration of soil and vegetation, and a plan ensuring financial resources will be available to fully decommission the site.

3. **A-1 Agriculture-Forestry District**. "Solar energy systems" shall be inserted as Section 5.041(C)(13).

4. BE IT FURTHER RESOLVED that this Resolution shall become effective immediately upon adoption, the public health, safety and welfare requiring it.

Approved and adopted by the Council of the Metropolitan Government of Lynchburg, Moore County, Tennessee on:

11-15-21

Date

Amy Hatfield

Recording Secretary

Bonnie Lewis

Metro Mayor

Metropolitan Government of Lynchburg/Moore County, Tennessee

January 26, 2022

To Whom it May Concern
U.S. Army Corps of Engineers
Nashville Regulatory District
3701 Bell Road
Nashville, Tennessee 37214

Subject: SR Tullahoma Solar Project
Jurisdictional Determination Request
Moore County, Tennessee

To Whom it May Concern,

A subsidiary of Silicon Ranch Corporation (SRC), SR Tullahoma, LLC (SR Tullahoma), intends to develop a site in Moore County, Tennessee, as a solar photovoltaic (PV) facility. The study area assessed for development of the facility ("Project Area") encompasses 3,463 acres north of Cobb Hollow Road, south of Old Shelbyville Highway, east of Wooley Road, and west of Cumberland Avenue (Appendix A, Figures 1 and 2). The Project Area partially overlaps the former Motlow Range (WWII Training Area), on which the U.S. Army Corps of Engineers (USACE) periodically conducts remediation of unexploded ordnances (UXOs). On behalf of SR Tullahoma, SRC has authorized HDR, Inc. (HDR) as its agent to submit to USACE the enclosed Jurisdictional Determination requests regarding the extent of jurisdictional and non-jurisdictional features within the Project Area (Appendix B).

Applicant Name: SR Tullahoma; POC: Mr. Dylan Hall
Mailing Address: 222 Second Ave S. Suite 1900, Nashville, TN 37201
Phone Number of Owner/Applicant: 615-943-7207
Project Location: North and South of Lynchburg Hwy, west of Tullahoma, TN in Moore County, TN
Basin: Elk River Watershed [Hydrologic Unit Code (HUC) 060300030405], Elk River Watershed [HUC 060300030402], and Mulberry Creek [HUC 060300030502]
Nearest City/Township: City of Tullahoma
County: Moore County
Center Decimal Degree Coordinates of Project Area: 35.350738°, -86.273682°
USGS Quadrangle Name: Tullahoma, TN and Lynchburg East, TN

Project Description

Prior to undertaking fieldwork, HDR scientists conducted a desktop review of the Project Area utilizing a number of resources. The assessed data are presented on several figures in Appendix A, as follows:

- **Figure 2**, U.S. Geological Survey (USGS) topographic maps;
- **Figure 3**, aerial imagery;
- **Figure 4**, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey;

- **Figure 5**, the on-site streams, wetlands, and floodplains as depicted in the USGS National Hydrography Dataset (NHD), the U.S. Fish and Wildlife Service (UWFWS) National Wetland Inventory (NWI), and the Federal Emergency Management Act (FEMA) National Flood Hazard Layer Viewer; and
- **Figure 6**, the 12-digit HUC watersheds as shown in the USGS NHD.

According to the USDA NRCS Soil Survey of Moore County (Figure 4), on-site soils consist of 14 separate soil units. Of these, Lee silt loam (Lb) and Guthrie silt loam (Gu) were listed as having hydric components. The USFWS NWI and USGS NHD depict several stream channels, including Hurricane Creek, West Fork Rock Creek, and North Fork Blue Creek, within the Project Area (Figure 5). No FEMA floodplains were mapped within the Project Area. The Project Area is within the Elk River, Elk River, and Mulberry Creek HUC-12 watersheds (Figure 6).

Jurisdictional Delineation

On April 26-30, May 17-21, June 14-18, 2021, HDR environmental scientists Ben Burdette, Wetland Professional In Training (WPIT), Tennessee Qualified Hydrologic Professional In Training (TN-QHP-IT); Karsen Williams; Diana Gu; Jessica Tisdale; James Young, Professional Wetland Scientist (PWS); and Lyranda Thiem, TN-QHP-IT, conducted field delineations of the Project Area for waters of the U.S. under Section 404 of the Clean Water Act (CWA). At the request of USACE and per revised guidance, Lyranda Thiem and Caroline Rycuik returned to the Project Area on November 16, 2021, to assess ephemeral aquatic resources as potential waters of the U.S.

Jurisdictional waters of the U.S. were delineated according to the methodology and guidance described in the USACE 1987 Wetland Delineation Manual, USACE 2008 Rapanos Guidance, and the 2012 USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0).Streams were classified utilizing the methodology and guidance provided in Regulatory Guidance Letter (RGL) 05-05 and the Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control Guidance for Making Hydrologic Determinations (Version 1.4) (TDEC 2011). Jurisdictional waters of the U.S were mapped using a Trimble® Geo7X GPS unit capable of sub-meter accuracy. GPS points were post-processed utilizing Trimble® GPS Pathfinder Office Software.

Results

The results of the on-site field investigation conducted by HDR indicate that there are 30 jurisdictional stream channels, 16 jurisdictional ephemeral conveyances, 18 jurisdictional wetlands, and three (3) jurisdictional ponds located within the Project Area (Appendix A, Figure 7). On-site waters of the U.S total 557.26 acres, including 64,684 linear feet of stream channel (Table 1). Hurricane Creek drains southeast through the western portion of the site and North Fork Blue Creek and West Fork Rock Creek drain northeast to east through the central portion of the site. All on-site surface waters eventually drain to the Elk River (HUC 06030003).

In accordance with the USACE Rapanos Guidance 2008, there are 20 ditches, four (4) non-jurisdictional ponds and 11 non-jurisdictional wetlands within the Project Area (Appendix B, Figure 8). On-site non-jurisdictional waters total 4.4 acres, including 12,721 linear feet of ephemeral conveyances or ditches (Table 1).

A summary of on-site jurisdictional waters can be found in Appendix D. A summary of on-site non-jurisdictional waters can be found in Appendix E. Data Forms can be found in Appendix F. Associated photographs are in Appendix G.

Table 1. Summary of On-Site Aquatic Resources

Type of Water	Flow Regime	Length (linear feet)	Area (acres)
Jurisdictional Features			
Streams (a)(2)[1]	Perennial	31,082	---
	Intermittent	27,011	---
	Ephemeral	6,591	--
Open Waters (a)(3)	---	---	1.91
Wetlands (a)(4)	---	---	555.35
	Total:	**64,684**	**557.26**
Non-Jurisdictional Features			
Ditches (b)(5)	--	12,721	---
Open Waters (b)(1)	---	---	1.27
Wetlands (b)(1)	---	---	3.13
	Total:	**12,721**	**4.4**

[1] These refer to the paragraphs of the USACE Rapanos Guidance 2008 wherein the particular water feature type is designated in regard to its jurisdictionally.

On behalf of Silicon Ranch Corporation, HDR is hereby requesting a Preliminary Jurisdictionl Determination for the jurisdictional waters and an Approved Jurisdictional Determination for the non-jurisdictional waters identified within the Project Area. Should you have any questions or require additional information following your review of the enclosed materials, or if you would like to schedule a site visit, please contact Karsen Williams at (404) 601-8681 (karsen.williams@hdrinc.com).

Sincerely,

Karsen Williams

Lyranda Thiem

Karsen Williams
Environmental Scientist

Lyranda Thiem, TN-QHP-IT
Environmental Scientist

Appendices: Appendix A: Jurisdictional Figures

Figure 1. Project Vicinity
Figure 2. USGS Topographic Quadrangles
Figure 3. Aerial Imagery
Figure 4. NRCS Soil Survey of Moore County, TN
Figure 5. NHD, NWI, and FEMA Datasets
Figure 6. 12-Digit Hydrologic Unit Code (HUC) Watershed
Figure 7. On-Site Jurisdictional Waters
Figure 8. Non-Aquatic Delineated Waters

Appendix B: On-Site Non-Jurisdictional Resources

Appendix C: Request for Corps of Engineers Jurisdictional Determination (JD) and/or Delineation Review Form & Navigable Waters Protection Rule Approved Jurisdictional Determination (AJD) Form

Appendix D: Summary of On-Site Jurisdictional Waters

Appendix E: Summary of On-Site Non-Jurisdictional Waters

Appendix F: Data Forms
- Tennessee Hydrologic Determination Field Data Sheets
- USACE Wetland Determination Forms
- USACE Antecedent Precipitation Tool Information

Appendix G: Photographs

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: U.S. Army Corps of Engineers, Nashville District, Regulatory Division

- I am requesting a JD on property located at: 222 Second Ave S. Suite 1900 Nashville, TN 37201
  (Street Address)
  City/Township/Parish: Tullahoma County: Moore State: TN
  Acreage of Parcel/Review Area for JD: 3,463
  Section: _____ Township: _____ Range: _____
  Latitude (decimal degrees): 35.350738° Longitude (decimal degrees): -86.273682°
  (For linear projects, please include the center point of the proposed alignment.)

- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
  ☐ I currently own this property. ☐ I plan to purchase this property.
  ☑ I am an agent/consultant acting on behalf of the requestor.
  ☐ Other (please explain): _____

- Reason for request: (check as many as applicable)
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ☑ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ☐ A Corps JD is required in order to obtain my local/state authorization.
  ☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ☐ I believe that the site may be comprised entirely of dry land.
  ☐ Other:): _____

- Type of determination being requested:
  ☑ I am requesting an approved JD.
  ☑ I am requesting a preliminary JD.
  ☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: Karsen Williams Date: 1/26/2022

- Typed or printed name: Karsen Williams

  Company name: HDR Engineering Inc, HDR

  Address: 1100 Peachtree Street NE, Suite 400
  Atlanta, GA 30309

  Daytime phone no.: 469.964.4898

  Email address: Karsen.Williams@hdrinc.com

***Authorities**: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USAGE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: December 13, 2021

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

Karsen Williams
HDR, Inc.
1100 Peachtree Street NE, Suite 400
Atlanta, Georgia 30309
Karsen.williams@hdrinc.com
470.558.4589

on behalf of

Emma Tillitski
SR Greenville I, LLC
222 Second Ave S. Suite 1900
Nashville, TN 37201
emma.tillitski@siliconranch.com
561-809-7848

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Nashville Regulatory District

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
North and South of Lynchburg Hwy, west of Tullahoma, TN in Moore County, TN

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: TN County/parish/borough: Moore County City: Tullahoma

Center coordinates of site (lat/long in degree decimal format): Lat.: 35.350738° Long.: -86.273682°

Universal Transverse Mercator:
NAD83

Name of nearest waterbody: Hurricane Creek
(Elk River Basin, HUC #060030003)

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

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): April 26-30, May 17-21, and June 14-18 , 2021

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Stream 1 (Intermittent)	35.356331	-86.248529	Length: 1,172ft. Width: 6 ft. Acres: 0.16 ac.	non-wetland waters	Section 404, non-section 10
Stream 2 (Perennial)	35.355294	-86.250805	Length: 2837ft. Width: 5 ft. Acres: 0.33 ac.	non-wetland waters	Section 404, non-section 10
Stream 3 (Perennial)	35.352778	-86.255686	Length: 3720ft. Width: 5 ft. Acres: 0.42 ac.	non-wetland waters	Section 404, non-section 10
Stream 4 (Intermittent)	35.350063	-86.247601	Length: 112 ft. Width: 3 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Stream 5 (Perennial)	35.350163	-86.350594	Length: 7536 ft. Width: 10 ft. Acres: 1.35 ac.	non-wetland waters	Section 404, non-section 10
Stream 6 (Perennial)	35.340926	-86.260967	Length: 2,496 ft. Width: 6 ft. Acres: 0.32 ac.	non-wetland waters	Section 404, non-section 10
Stream 7 (Intermittent)	35.360692	-86.264472	Length: 564 ft. Width: 4 ft. Acres: 0.05 ac.	non-wetland waters	Section 404, non-section 10
Stream 8 (Perennial)	35.356819	-86.264968	Length: 5,310 ft. Width: 8 ft. Acres: 0.61 ac.	non-wetland waters	Section 404, non-section 10
Stream 9 (Intermittent)	35.354651	-86.27890	Length: 633 ft. Width: 3 ft. Acres: 0.06 ac.	non-wetland waters	Section 404, non-section 10
Stream 10 (Perennial)	35.361379	-86.260856	Length: 8,724 ft. Width: 7 ft. Acres: 1.50 ac.	non-wetland waters	Section 404, non-section 10
Stream 11 (Intermittent)	35.356215	-86.266391	Length: 154 ft. Width: 4 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Stream 12 (Intermittent)	35.346922	-86.273977	Length: 899 ft. Width: 4 ft. Acres: 0.06 ac.	non-wetland waters	Section 404, non-section 10
Stream 13 (Intermittent)	35.346721	-86.274591	Length: 1006 ft. Width: 4 ft. Acres: 0.07 ac.	non-wetland waters	Section 404, non-section 10
Stream 14 (Intermittent)	35.361531	-86.286329	Length: 2354 ft. Width: 7 ft. Acres: 0.38 ac.	non-wetland waters	Section 404, non-section 10
Stream 15 (Intermittent)	35.364100	-86.294717	Length: 1006 ft. Width: 5 ft. Acres: 0.16 ac.	non-wetland waters	Section 404, non-section 10
Stream 16 (Intermittent)	35.343962	-86.282060	Length: 3,127 ft. Width: 4 ft. Acres: 0.36 ac.	non-wetland waters	Section 404, non-section 10
Stream 17 (Intermittent)	35.343097	-86.291975	Length: 772 ft. Width: 8 ft. Acres: 0.14 ac.	non-wetland waters	Section 404, non-section 10
Stream 18 (Intermittent)	35.344683	-86.295781	Length: 171 ft. Width: 11 ft. Acres: 0.04 ac.	non-wetland waters	Section 404, non-section 10
Stream 19 (Intermittent)	35.344654	-86.296134	Length: 66 ft. Width: 4 ft. Acres: <0.01 ac.	non-wetland waters	Section 404, non-section 10
Stream 20 (Perennial)	35.356320	-86.303309	Length: 2,403 ft. Width: 10 ft. Acres: 0.85 ac.	non-wetland waters	Section 404, non-section 10
Stream 21 (Perennial)	35.350237	-86.300638	Length: 459 ft. Width: 10 ft. Acres: 0.11 ac.	non-wetland waters	Section 404, non-section 10
Stream 22 (Intermittent)	35.340820	-86.300634	Length: 110 ft. Width: 6 ft. Acres: 0.02 ac.	non-wetland waters	Section 404, non-section 10
Stream 23 (Intermittent)	35.350126	-86.302746	Length: 142 ft. Width: 4 ft. Acres: 0.02 ac.	non-wetland waters	Section 404, non-section 10
Stream 24 (Intermittent)	35.344863	-86.313037	Length: 4,674 ft. Width: 15 ft. Acres: 1.6 ac.	non-wetland waters	Section 404, non-section 10
Stream 25 (Intermittent)	35.356364	-86.303554	Length: 1539 ft. Width: 15 ft. Acres: 0.32 ac.	non-wetland waters	Section 404, non-section 10

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Stream 26 (Intermittent)	35.351364	-86.311217	Length: 3387 ft. Width: 15 ft. Acres: 0.98 ac.	non-wetland waters	Section 404, non-section 10
Stream 27 (Intermittent)	35.355811	-86.307554	Length: 756 ft. Width: 6 ft. Acres: 0.10 ac.	non-wetland waters	Section 404, non-section 10
Stream 28 (Intermittent)	35.364814	-86.307074	Length: 1696 ft. Width: 5 ft. Acres: 0.19 ac.	non-wetland waters	Section 404, non-section 10
Stream 29 (Intermittent)	35.363165	-86.303020	Length: 104 ft. Width: 4 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Stream 30 (Intermittent)	35.363834	-86.302563	Length: 75 ft. Width: 5 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 1	35.344412	86.29344	Length: 659 ft. Width: 3 ft. Acres: 0.03 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 2	35.356254	-86.245695	Length: 1849 ft. Width: 5 ft. Acres: 0.21 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 3	35.355886	-86.251204	Length: 235 ft. Width: 2 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 4	35.348989	-86.251053	Length: 163 ft. Width: 2 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 5	35.350576	-86.265044	Length: 89 ft. Width: 2 ft. Acres:< 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 6	35.341661	-86.261227	Length: 284 ft. Width: 2 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 7	35.359191	-86.263108	Length: 460 ft. Width: 2 ft. Acres: 0.02 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 8	35.361552	-86.286310	Length: 1133 ft. Width: 4 ft. Acres: 0.10 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 9	35.343825	-86.282561	Length: 102 ft. Width: 4 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 10	35.344500	-86.295922	Length: 210 ft. Width: 3 ft. Acres: 0.02 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 11	35.350794	-86.301725	Length: 387 ft. Width: 8 ft. Acres: 0.07 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 12	35.351333	-86.301917	Length: 416 ft. Width: 8 ft. Acres: 0.08 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 13	35.352317	-86.306786	Length: 120 ft. Width: 4 ft. Acres: 0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 14	35.348131	-86.310976	Length: 82 ft. Width: 4 ft. Acres: <0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 15	35.347231	-86.310952	Length: 140 ft. Width: 4 ft. Acres: <0.01 ac.	non-wetland waters	Section 404, non-section 10
Ephemeral 16	35.346996	-86.312603	Length: 262 ft. Width: 4 ft. Acres: 0.02 ac.	non-wetland waters	Section 404, non-section 10

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland 1 (PEM1/PSS)	35.356108	-86.251962	5.93	Wetland	Section 404, non-section 10
Wetland 2 (PFO1)	35.35479	-86.249278	0.41	Wetland	Section 404, non-section 10
Wetland 3 (PFO/PSS)	35.35209	-86.254602	3.72	Wetland	Section 404, non-section 10
Wetland 4 (PFO1/PSS1)	35.350072	-86.245533	28.64	Wetland	Section 404, non-section 10
Wetland 5 (PFO1)	35.341213	-86.261515	0.57	Wetland	Section 404, non-section 10
Wetland 6 (PSS1/PFO1)	35.344076	-86.266689	6.6	Wetland	Section 404, non-section 10
Wetland 7 (PEM1)	35.344533	-86.27291	8.6	Wetland	Section 404, non-section 10
Wetland 8 (PFO1)	35.343637	-86.27653	2.02	Wetland	Section 404, non-section 10
Wetland 9 (PFO1)	35.358382	-86.262876	68.40	Wetland	Section 404, non-section 10
Wetland 10 (PFO1)	35.362125	-86.261301	0.63	Wetland	Section 404, non-section 10
Wetland 11 (PFO1)	35.363163	-86.27108	7.85	Wetland	Section 404, non-section 10
Wetland 12 (PFO1/PEM1)	35.355669	-86.283479	327.22	Wetland	Section 404, non-section 10
Wetland 13 (PFO1/PEM1)	35.355894	-86.274517	5.36	Wetland	Section 404, non-section 10
Wetland 14 (PFO1)	35.353605	-86.279061	1.79	Wetland	Section 404, non-section 10
Wetland 15 (PFO1)	35.350119	-86.300775	0.20	Wetland	Section 404, non-section 10
Wetland 16 (PFO1)	35.349358	-86.299744	0.02	Wetland	Section 404, non-section 10
Wetland 17 (PFO1)	35.351528	-86.31102	0.17	Wetland	Section 404, non-section 10
Wetland 18 (PFO1/PEM1)	35.347506	-86.315926	87	Wetland	Section 404, non-section 10
Open Water 1	35.345414	-86.26911	0.16	Non- Wetland	Section 404, non-section 10
Open Water 2	35.344723	-86.271489	0.55	Non-Wetland	Section 404, non-section 10
Open Water 3	35.363525	-86.303241	1.2	Non-Wetland	Section 404, non-section 10

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre- construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: Figures 1, 2, 3, 4, 5, 6

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale:_____

☐ Data sheets prepared by the Corps:_____

☐ Corps navigable waters' study:_____

☐ U.S. Geological Survey Hydrologic Atlas:_____

☒ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: 1":24,000' Jeroldstown, TN

☒ Natural Resources Conservation Service Soil Survey. Citation: NRCS Soils Survey of Greene Co. (2019)

☒ National wetlands inventory map(s). Cite name: USFWS NWI (2018)

☐ State/local wetland inventory map(s):_____

☒ FEMA/FIRM maps: 47059C0150D

☐ 100-year Floodplain Elevation is:_____ (National Geodetic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): National Geographic Society, i-cubed (Bing.com) (2013)

or ☒ Other (Name & Date): Site photographs, dated September 2021

☐ Previous determination(s). File no. and date of response letter:_____

☐ Other information (please specify):_____

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Karen Williams 1/26/2022

Signature and date of Regulatory staff member completing PJD

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): 1/26/022
ORM Number:
Associated JDs: N/A
Review Area Location[1]: State/Territory: Tennessee City: Tullahoma County/Parish/Borough: Moore
Center Coordinates of Review Area: Latitude 35.350738° Longitude -86.273682°

II. FINDINGS

A. Summary: Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- ☐ The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- ☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).
- ☒ There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in Section II.C).
- ☒ There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)[2]

§ 10 Name	§ 10 Size		§ 10 Criteria	Rationale for § 10 Determination
N/A.	N/A.	N/A	N/A.	N/A.

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters):[3]				
(a)(1) Name	(a)(1) Size		(a)(1) Criteria	Rationale for (a)(1) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
Stream 1	1,172	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 2	2,837	linear feet	(a)(2) Perennial tributary contributes	The subject water has perennial flow, and eventually flows into North Fork Blue Creek (a)(2).

[1] Map(s)/figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
			surface water flow directly or indirectly to an (a)(1) water in a typical year.	
Stream 3	3,720	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has perennial flow. This feature is named stream North Fork Blue Creek.
Stream 4	112	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 5	7,536	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has perennial flow.
Stream 6	2,496	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has perennial flow.
Stream 7	564	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 8	5,310	linear feet	(a)(2) Perennial tributary contributes	The subject water has perennial flow. This feature flows into West Fork Rock Creek (a)(2).

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
			surface water flow directly or indirectly to an (a)(1) water in a typical year.	
Stream 9	633	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 10	8,724	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has perennial flow. This feature is West Fork Rock Creek.
Stream 11	154.84	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This feature flows into West Fork Rock Creek (a)(2).
Stream 12	899	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 13	1,006	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 14	2,354	linear feet	(a)(2) Intermittent tributary contributes	The subject water has intermittent flow.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
			surface water flow directly or indirectly to an (a)(1) water in a typical year.	
Stream 15	1,006	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 16	3,127	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This feature flows into a perennial stream (Stream 17) and then into Hurricane Creek.
Stream 17	772	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream flows into Hurricane Creek.
Stream 18	171	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream flows into Hurricane Creek.
Stream 19	66	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream flows into Hurricane Creek.
Stream 20	2,403	linear feet	(a)(2) Perennial tributary contributes	The subject water has perennial flow. This feature is Hurricane Creek.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
			surface water flow directly or indirectly to an (a)(1) water in a typical year.	
Stream 21	459	linear feet	(a)(2) Perennial tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has perennial flow. This stream flows into Hurricane Creek via a culvert under Cumberland Springs Road.
Stream 22	110	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream begins at a spring head and flows into Hurricane Creek.
Stream 23	142	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. The stream begins at a spring head and flows into Hurricane Creek.
Stream 24	4,674	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream flows into Hurricane Creek.
Stream 25	1,539	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow. This stream flows into Hurricane Creek.
Stream 26	3,387	linear feet	(a)(2) Intermittent tributary contributes	The subject water has intermittent flow. This stream flows into Stream 25 (a)(2), which flows into Hurricane Creek.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
			surface water flow directly or indirectly to an (a)(1) water in a typical year.	
Stream 27	756	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 28	1,696	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 29	104	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Stream 30	75	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The subject water has intermittent flow.
Ephemeral 1	659	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.

Ephemeral 2	1,849	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 3	235	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 4	163	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 5	89	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 6	284	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 7	460	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.

Ephemeral 8	1,133	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 9	102	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 10	210	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 11	387	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 12	416	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 13	120	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.

Ephemeral 14	82	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 15	140	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.
Ephemeral 16	262	linear feet	(b)(3) Ephemeral feature, includingan ephemeral stream, swale, gully, rill, or pool	This feature is an ephemeral stream.

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size		(a)(3) Criteria	Rationale for (a)(3) Determination
Open Water 1	0.16	acre(s)	(a)(3) Lake/pond or impoundment of a jurisdictional water inundated by flooding from an (a)(1)-(a)(3)	This feature connects to (a)(4) wetland that connects to an (a)(2) stream that flows off-site.

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size		(a)(3) Criteria	Rationale for (a)(3) Determination
			water in a typical year.	
Open Water 2	0.55	acre(s)	(a)(3) Lake/pond or impoundment of a jurisdictional water inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	The feature is directly connected to a (a)(4) wetland that connects to an (a)(2) stream that flows off-site.
Open Water 3	1.20	acre(s)	(a)(3) Lake/pond or impoundment of a jurisdictional water inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	The feature is directly connected to a (a)(2) stream that connects to another (a)(2) stream that flows off-site.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size		(a)(4) Criteria	Rationale for (a)(4) Determination
Wetland 1	5.93	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(1) and (a)(3) water.
Wetland 2	0.41	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(1) and (a)(3) water.
Wetland 3	3.72	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(3) water.
Wetland 4	28.64	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 5	0.57	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 6	6.60	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water and an (a)(3) open water.
Wetland 7	8.60	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water and an (a)(3) open water.
Wetland 8	2.02	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size		(a)(4) Criteria	Rationale for (a)(4) Determination
Wetland 9	68.40	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 10	0.63	acre(s)	(a)(4) Wetland separated from an (a)(1)-(a)(3) water only by an artificial structure allowing a direct hydrologic surface connection between the wetland and the (a)(1)-(a)(3) water, in a typical year.	This feature is connected to an (a)(2) feature (Stream 10) via a culvert under Lynchburg Highway.
Wetland 11	7.85	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 12	327.22	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 13	5.36	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 14	1.79	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 15	0.20	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 16	0.02	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water, which is located offsite
Wetland 17	0.38	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.
Wetland 18	87.02	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This feature abuts at least one point or side of an (a)(2) water.

D. Excluded Waters or Features

Excluded waters ((b)(1) – (b)(12)):[4]				
Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
Non-Jurisdictional Open Water 1	0.48	acre(s)	(b)(1) Lake/pond or impoundment that does not contribute surface water flow directly or indirectly to an (a)(1) water and is not inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	This feature is an isolated open water with no connection to an (a)(1)-(a)(4) water. It's connected to a (b)(1) non-jurisdictional wetland. Otherwise, it is completely isolated.
Non-Jurisdictional Open Water 2	0.48	acre(s)	(b)(1) Lake/pond or impoundment that does not contribute surface water flow directly or indirectly to an (a)(1) water and is not inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	This feature is an isolated open water with no connection to an (a)(1)-(a)(4) water. This feature is connected to a (b)(3) ephemeral conveyance. Both features are isolated.
Non-Jurisdictional Open Water 3	0.48	acre(s)	(b)(1) Lake/pond or impoundment that does not contribute surface water flow directly or indirectly to an (a)(1) water and is not inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	This feature is an isolated open water with no connection to an (a)(1)-(a)(4) water. This feature is completely isolated.
Non-Jurisdictional Open Water 4	0.48	acre(s)	(b)(1) Lake/pond or impoundment that does not contribute surface water flow directly or indirectly to an (a)(1) water and	This feature is an isolated wetland to with no connection to an (a)(1)-(a)(4) water. This feature is completely isolated.

[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

Excluded waters ((b)(1) – (b)(12)):[4]				
Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
			is not inundated by flooding from an (a)(1)-(a)(3) water in a typical year.	
Non-Jurisdictional Wetland 1	0.68	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 2	0.08	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 3	0.50	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 4	0.09	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water. This feature is only connected to an (b)(1) non-jurisdictional open water.
Non-Jurisdictional Wetland 5	0.14	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 6	0.38	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 7	0.05	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 8	0.82	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 9	0.09	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 10	0.09	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Non-Jurisdictional Wetland 11	0.34	acre(s)	(b)(1) Non-adjacent wetland.	This feature is an isolated wetland with no connection to an (a)(1)-(a)(4) water.
Ditch 1	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 2	0.90	acre(s)	(b)(3) Ephemeral feature, including an ephemeral	This feature is an ephemeral stream.

Excluded waters ((b)(1) – (b)(12)):[4]				
Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
			stream, swale, gully, rill, or pool.	
Ditch 3	0.87	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 4	<0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 5	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 6	0.02	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 7	0.02	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 8	0.04	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 9	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 10	0.02	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 11	0.03	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.

Excluded waters ((b)(1) – (b)(12)):[4]				
Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
Ditch 12	0.07	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 13	0.03	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 14	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 15	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 16	<0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 17	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 18	0.03	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 19	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.
Ditch 20	0.01	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This feature is an ephemeral stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 14:10
Assessors/Affiliation: Lyranda Thiem- QHP-IT and Jessica Tisdale		Project ID : SRC Moore
Site Name/Description: Stream 1- Intermittent Stream		
Site Location: Perrenial stream located with a forested area near the northeast portion of the project		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.354437/ -86.247254
Previous Rainfall (7-days) : In the previous 7 days it rained 0.20 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 27.75

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 7 also was not used because it had rained in the previous four days (0.20 inch).

There is active logging occuring on this site. The logging has altered the length and flow of this channel due to logging vehicles being driven across the stream.

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	1	2	3
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 NA	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 27.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Evident bed and bank throughout the stream with the exception of a small portion in the upstream portion of the channel. 3) Most of the stream consisted of longer runs. 4). Two smaller sections where gravel substrate is sorting from the finner sandy substrates. 7). Near the start of the stream (upstream) there is one small braided sections consisting of two channels with an island in between. 11). Four plus small to medium sized logs across the channel bed acting as a grad control throughout the entire channel. 13). UNT to North Fork Creek; this mapped stream is smaller than what is originally mapped for the blue lined stream due to disruption by logging activities which included creating a logging road. The blue line now is mapped with the flow of another channel (labled SA3 during field survey). 15) Ranges from approximately 6 inches to 1 foot. 16) Leaf piles were observed downstream. 19). Due to being on an old WWII site we were instructed not to dig in certain areas, this being one of them. 20) 1 of 4 times digging fiborous roots were found. 21) Upstream portion of channel has some rooted sweetgum trees. 25). One fly larve (Diptera sp.) and 5 midges (not red midges). 26) Downstream portion of channel has a greater amount than upstream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 11:27
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 2- Perennial Stream		
Site Location: Perrenial stream located with a forested area near the northeast portion of the project		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351602/ -86.246583
Previous Rainfall (7-days) : In the previous 7 days it rained 0.20 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 33

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous four days (0.20 inch).

There is active logging occuring on this site. The logging has altered the flow of this channel due to logging vehicles driving across stream.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =16.25)	**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	1	2	3
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 = 6.5)	**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 =10.25)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 33

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Evident bed and bank throughout the entire stream. 3). In the upstream portion of the channel there are more runs than riffles and pools, however when heading downstream the riffle pool sequences become very previlent. 6) There were at least 3 medium sized bars throughout the channel. 7) Near the middle section of the stream there is one smaller braided area (with two channels and one island). 11). Several (3+) smaller logs have created grade controls throughout the channel. 12). The surrounding area of the stream is fairly flat. 15) Water within the channel ranges from 6 inches to about a foot of water. 18) Three spots across the channel that have medium to small drift lines. 20). 2 of the 5 diggigs contained fiborous roots. 24). Tadpoles were observed near the upstream portion of the stream but not downstream. 25). 3 damselfly larvae, 6 mayflies one stick forming caddisfly, 5 scuds, and 8 midges were observed with moderate amount of searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette-QHP-IT/ HDR		Project ID : SR Moore
Site Name/Description: Stream 3, Perennial Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 29

Justification / Notes : This stream runs through a forested region within the eastern portion of the project area.

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 20)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 29

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 inches to 1 foot and a bank width of 6 to 8 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture of small gravel and clay. 7) Throughout the entirety of this stream there are multiple times the stream had many channels braiding for about five feet and then would come back into one. 11). Grade controls consisted of fallen logs (smaller) with only a couple (2-3) throughout the entire stream. 15). Water depth in the channel ranged from 6 inches to 1 foot. 20). Fiborous roots were located in the upstream portions of the stream. 24). Amphibians within the stream consisted of leapord frogs.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/26/2021 11:50
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 4- Intermittent Stream flows into blue lined stream		
Site Location: Intermittent stream located with a forested area near southeast portion of the project site.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350154/ -86.247431
Previous Rainfall (7-days) : In the previous 7 days it rained 1.45 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight **Absent**		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous seven days (1.45 inch).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10)	**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	1	2	3
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 = 5.75)	**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 NA	No = 0		Yes = 1.5	

C. Biology (Subtotal =6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Strong bed/ bank (at least a foot) throughout the channel except for the very start/upstream portion of the channel. 2) Sinousity is absent, fairly straight channel that leads into North Fork Creek. 3) Two smaller portions of sorting between gravel substrates from the sandy substrates near the downstream portion of the channel. 4). About 10 to 20 feet of floodplain on the right hand bank side of stream and on the left hand side there is a 4-6 foot stream with floodplain after it. 11) 1 smaller logs across the channel acting as a grade control near the downstream portion of the channel. 25) Water level ranges from 2 to 6 inches throughout the stream. 19) This section was not completed because this project site lies in an old WWII site so we were given orders to not conduct any digging due to the possiblity of UXO objects. 20). 3 out 5 times there was fiborous roots within the channel bed. 23) Small red maple within the upstream portion. 33) Two crayfish adults found in moderate searching 24). One fingernail claim found in moderate searching. 25). One damselfly found with moderate searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/26/2021 13:15
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 5- Perennial Stream / SR Tullahoma		
Site Location: Perennial stream located with a forested area near southeast portion of the project site.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long:
Previous Rainfall (7-days) : In the previous 7 days it rained 1.45 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous seven days (1.45 inch).

At this site there has been active logging by foresty. There are a couple of spots where the stream is interupted due to roads being built across them. Beavers have also been altering the water slightly with there dam about midway up the stream.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =21.5)	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	1	2	3
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 = 6)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal =9.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Strong bed/ bank (at least a foot) throughout the channel except for the very start/upstream portion of the channel. 2) Sinousity is moderate as there are many meandering curves throughout the entire channel length. 4). There is evidence of sorting occuring throughout the downstream portion of the channel with the gravely substrates seperating from the sand. 5) 10 to 20 feet of floodplain throughout most of the channel. Near the upstream portion of the channel the floodplain is a little less between 5-10 feet. 6) Four fairly large bars throughout the stream. 8) Two larger alluvial deposits observed throughout the channel. 10&11) Two smaller headcuts and Several larger log and or rock grade controls throughout the channel. 13) Labeled as North Fork Blue Creek on maps.19) Due to being on an old WWII site we were instructed not to dig due to the potential for UXO objects below the surface. 20) 1 of 5 times had fiborous roots. 25) 1 mayfly and 10+ midges were observed with moderate searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/20/21, 5:14pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 6, Perennial Stream		
Site Location: Stream 6 drains W6 and flows southeast towards W5, located near W. Lincoln St.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.340926, -86.266513
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 35

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 17)	**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	1	2	3
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 = 6.5)	**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 = 11.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 35

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 0.6-2', width 2-8'. Sandy substrate with some gravel.
Amphibians: tadpoles, salamanders
Macros: Mayflies, 5+ scuds

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 7, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 29

Justification / Notes : This stream runs through a forested region within the eastern portion of the project area.

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 29

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 inches to 1 foot and a bank width of 6 to 8 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture of small gravel and clay. 7) Throughout the entirety of this stream there are multiple times the stream had many channels braiding for about five feet and then would come back into one. 11). Grade controls consisted of fallen logs (smaller) with only a couple (2-3) throughout the entire stream. 15). Water depth in the channel ranged from 6 inches to 1 foot. 20). Fiborous roots were located in the upstream portions of the stream. 24). Amphibians within the stream consisted of leapord frogs.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/19/2021 9:00
Assessors/Affiliation: Lyranda Thiem and James Young/ HDR		Project ID : SR Moore
Site Name/Description: Stream 8, Perennial Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37

Justification / Notes :

Heavy logging occured near the downstream portion of the stream altering water regime. This stream was originally

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 19)	**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	1	2	3
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 = 10)	**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 = 8)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 25) water beetles (10+), scubs (3), fly larva (diptera)

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/18/2021 16:55
Assessors/Affiliation: Lyranda Thiem- QHP-IT/HDR and James Young/ HDR		Project ID : SR Moore
Site Name/Description: Stream 9, Intermittent Stream, Tullahoma Solar Project		
Site Location: Flows into Stream 8 located south of lynchburg highway		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.85 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21.75

Justification / Notes :

Heavy logging occured near the downstream portion of the stream altering water regime. This stream was originally mapped as a blue line stream, but flows primarily from the a nearby stream that has taken most of the flow. In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10.75)	**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	1	2	3
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 = 6)	**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)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 to 8 inches and a bank width of 2 to 4 feet. 2). The lower portion had increased sinuosity. 4). Bed substrate similar to bank substrate with little gravel intermixed. 10). No headcuts occured, but multiple medium sized logs acted as grade controls throughout the stream 13). Although it is mapped as a blue lined stream the flow primarly comes from a different nearby stream due to logging activities. Biology; no water occured in the stream so most of the biology section did not occur.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/28/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 10, Perennial Stream West Fork Rock Creek, Tullahoma Solar Project		
Site Location: USGS Blue Line stream labeled as West Fork Rock Creek, southeastern section of the project area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352369/-86.269557
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 41.5

Justification / Notes : This is a mapped blueline stream (West Fork Rock Creek) that runs through the eastern portion the project area. In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 24.5)	**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	1	2	3
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 = 9.0)	**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 = 8.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 41.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of 4 to 10 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a sand and gravel. 5) A floodplain wetland follows the stream from start to finish. 7) In the middle sections of the stream mutiple braided channels occur for about 5 feet. 11) No head cuts occur throughout the stream but various medium sized logs and boulders cross the stream acting as grade controls.13) This is a named blueline stream called West Fork Rock Creek.15) In the past 48 hours it rained 0 inches; water depth ranged from 6 inches to 2 feet. 24). Amphibians within the stream consisted of leapord frogs and green frogs. These were observed with a moderate amount of looking. 25) Macros included 3 water beetles, midges (10+), and rock caddisfly all with 10-15 minutes of looking.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 15:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 11, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.356058/-86.266360
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23.5

Justification / Notes : This stream is a unnamed tributary to West Fork Rock Creek.

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 23.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 0.5 feet to 2 feet and a bank width of 2 to 4 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture mud. 5). A floodplain wetland surround this stream and West Fork Rock Creek.11) Grade controls within the stream conisted of two-three log across the stream. 15) Water depth in the channel ranged from 6 inches to a foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/18/21, 9:57am
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 12, Intermittent Stream		
Site Location: Stream 12 drains from W7 and flows northwest into Wetland 9		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344855, -86.273977
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu), Dickson silt loam, 0-2% slopes (DkA), Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**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	1	2	3
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 = 8.5)	**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)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <0.5-2', width 3-10'. Mucky loam substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 1:24pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 13, Intermittent Stream		
Site Location: Stream 13 blows out into W9		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344509, -86.276221
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. Previously damned area.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**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	1	2	3
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 = 7)	**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 = 8)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <0.5', width 3'. Gravel and silty sand substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/15/2021 10:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT, Diana Gu		Project ID : SR Tullahoma
Site Name/Description: Stream 14, SR Tullahoma		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.361562, -86.286322 End: 35.362070, -86.293206
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes : See reverse.

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	1	2	3
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 = 6)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts from a WWC. Appears to have been ditched at some point. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and mud. Lower reaches have significant pools of water. No fish or obligate organisms identified. Headwaters for Hurricane Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/15/2021 11:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT, Diana Gu		Project ID : SR Tullahoma
Site Name/Description: Stream 15, Intermittent Stream		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.364109, -86.294654 End: 35.362129, -86.293685
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight **Absent**		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19

Justification / Notes : See reverse.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 12)	**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	1	2	3
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 = 3)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts off site. Dry bed but evidence of sediment on limited leaves in streambed. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and gravel. Evidence of significant flow events in the past.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 16, Intermittent, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.342766/-86.293976
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 24

Justification / Notes : This stream runs through a forested region within the southern portion of the project area.

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 13)	**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	1	2	3
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 = 7)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 24

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 6 feet and a bank width of 2 to 6 feet. 2).Throughout the channel remains fairly sinous. 4) Sorting of cobble / rubble substrates from silty sand and gravel is common throughout the stream. 10) One headcut occuring where water reemerges after going underground for a ways 15) Water in channel ranged from 6 inches to a foot or more.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 13:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 17, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.342783°/ -86.294005°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14)	**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	1	2	3
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 = 7.5)	**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 = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 2 feet and bank bank width ranged from 8 to 12 feet. 4) Sorting of cobble from gravel and silty substrate. 14) Multiple springs flow into this stream. 15) Water depth in channel ranged from 6 inches to 3 feet. 24) Three leapord frogs were found within the stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 13:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 18, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.344654°/ -86.296134°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.
Bank height ranged from 1 to 4 feet and bank width was 2 feet on both sides.

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	1	2	3
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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 12:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 19, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.344654°/ -86.296134°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.
Bank height ranged from 1 to 4 feet and bank width was 2 feet on both sides.

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	1	2	3
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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 11:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 20, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.356320°/ -86.303309°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : 5) Obligate macros found include caddisflies and mayflies. 6) Fish were not key out to species, but was noted they were not gambusia. 7) Multiple springs occured along the length of the stream. Bank width ranged from 12 to 20 feet and bank height ranged from 4 to 15 feet.

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	1	2	3
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 = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:21pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 21, Perennial Stream		
Site Location: Stream 21 flows in from off-site, flows under Cumberland Springs Rd, and drains into Hurricane Ck		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349188, -86.299966
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Hawthorne-Sugargrove complex (HsC) and Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =17.5)	**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	1	2	3
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 = 7.5)	**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 =12.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1', width 8'. Cobble, muck, and sand substrate. Some sorting

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 4:25pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 22, Intermittent Stream		
Site Location: Begins as a spring and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.340820, -86.300408
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	1	2	3
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 = 7)	**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 =10)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <1', width 0.5-4'. Cobble and gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:17pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 23, Intermittent Stream		
Site Location: Begins as a spring and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349864, -86.301438
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =15)	**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	1	2	3
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 = 7)	**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 =6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 0.5-1', width 2-3'. Gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 3:58pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 24, Intermittent Stream		
Site Location: Drains W18, flows under road, and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344863, -86.313037
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En) on Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 26.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =16.5)	**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	1	2	3
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 = 6)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 26.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 2-5', width 3-10'. Cobble, gravel, and small rock substrate. Culvert under Cumberland Road.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 12:36pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 25, Intermittent Stream		
Site Location: Flows into site via double CMP culvert. Drains into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.356364, -86.303554
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**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	1	2	3
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 = 6.5)	**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 = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 23

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 2-3', width 8'. Gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 10:12am
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 26, Intermittent Stream		
Site Location: Starts as WWC, develops into stream, and flows into Stream 25		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.351364, -86.311217
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Dickson silt loam, 0-2 percent slopes (DkA)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway; agricultural field nearby		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 15)	**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	1	2	3
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 = 6)	**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 = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 27

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 4-8'. Cobble and some gravel substrate.
Water in 2nd half of stream.
Tadpoles, green frogs, leopard frogs.
Stringy grass in channels.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 11:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 27, Intermittent Stream,Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.355811°/ -86.307554°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**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	1	2	3
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 = 6)	**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 = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 3 feet and bank width ranged from 2 to 4 feet. 4) Sorting of gravel from sandy substrates.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 9:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 28 & Stream 29, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.351364°/ -86.311217°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : This meets the primary indicator 6 due to finding small mouth bass minnows in the channel. This stream form is representative of both stream 28 and 29 because they are the same stream just seperated by a wetland in the middle of them.

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	1	2	3
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 = 6.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 2 feet and bank bank width ranged from 2 to 4 feet. 4) Sorting of substrates was little; the only sorting that occured in this stream was silty substrates from mud.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/16/2021 10:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT		Project ID : SR Tullahoma
Site Name/Description: Stream 30, Intermittent Stream		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.363785, -86.302551 End: 35.363692, -86.302718
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Dickson silt loam (DkA)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	-	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	-	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	-	Stream
7. Presence of naturally occurring ground water table connection	-	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes : See reverse.

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	1	2	3
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 = 6)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts from a WWC. Appears to have been ditched at some point. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and mud. Lower reaches have significant pools of water. No fish or obligate organisms identified. Headwaters for Hurricane Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 12:48
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Tullahoma
Site Name/Description: Ephemeral1 / SR Tullahoma		
Site Location: WWC located in the top northeast portion of the project site. This WWC flows into a stream.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.353869/-86.245742
Previous Rainfall (7-days) : In the previous 7 days it rained 0.85 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 13.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 0.85 inches in the previous seven days. Channel was mostly dry except for the last 4 feet down -stream where is connects to a blue line stream.

There is active logging occuring upstream of site near the WWC and residential housing on the other side of the channel.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 9)	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	1	2	3
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 = 3.25)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 1)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bed and bank evident throughout the entire channel reach 2). The channel is fairly straight upstream, however as you move downstream it becomes much more sinous 3). There are a few (2) deeper pools along the channel. The channel was mostly dry during the time of the field survey. 4) Near the downstream portion of the channel there were two smaller spots were it looked like some gravely substrate was sorting from the sandy substrate. 7) Near the downstream portion where this channel enters a stream there is some braiding occuring (only two channels forming) 10). One large headcut in the middle of the channel. 11) There are several (4) smaller log grade controls throughout the channel. 12) The surrounding area is fairy flat with residential community on pne side and a logging site on the other. 15) The last 4-5 feet of stream had about 6 inches of standing water in the channel. 19) The soil was not checked because this site is on an old WWII training site so due to safelty reasons no digging could occur. However, the other streams across the site that were sampled on the same day contained water throughout the entire channel (at least 1 foot). 20) Each of the 5 digs contained fiborous routes.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/27/2021 18:00
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Ephemeral 2/ SR Tullahoma		
Site Location: WWC located in the northeast portion of the project site. It flows from a wetland down across a logging road into a stream.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355482/ -86.250589
Previous Rainfall (7-days) : In the previous 7 days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 8.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.35 inches in the previous seven days.

This WWC flows from a PEM/PSS wetland down across a logging road. A stream starts on the other side of the logging road.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =2)	**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	1	2	3
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 = 3.75)	**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 =2.50)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Some bed and bank within the middle section of the channel. No bed/bank upstream or downstream. 2). Better sinousity upstream before the road. 15). In the past 48 hours it rained 0.75 inches the amount of water within the channel is about 6 inches (middle section). The downstream section near the roadway was about 1-2 inches of water. 16) Multiple sections within the stream bed had bunches of leaves. 19). One of the three draws had hydric soils. The draw that had hydric soils flowed through a wetland. 20). Out of the three times dug each time I pulled up fiborous roots. 21) Near the upstream portion of the channel there was sedges within the channel bed. 25) 8+ scuds and 2 sow bugs were observed in the channel with moderate amount of searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/19/21, 1:38
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 3		
Site Location: located in western side of study area, draining into North Fork Blue Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.348854, -86.251279
Previous Rainfall (7-days) : No		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. No water in channels or rain within last 7 days.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 5)	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	1	2	3
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 = 3.5)	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 = 1)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Ephemeral flows into blueline N. Fork Blue Creek. Substrate consists of silty clay loam. Small logs across channel, vegetation is dominated by red maple across channel. Width about 2-4 feet, depth 6"-1'

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/27/2021 11:47
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Ephermal 4/ SR Tullahoma		
Site Location: WWC located in the eastern portion of the project site. Flows into an intermittent stream		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350534/ -86.264781
Previous Rainfall (7-days) : In the previous 7 days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.35 inches in the previous seven days.

Active logging occured on both sides of the small forested region this channel is in.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =7.5)	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	1	2	3
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 = 3.5)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal =1.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Very small banks (6 inches or so) throughout the entire channel. 2) Some sinousity as it meanders with the forested area. 7). Near the upstream portion the the channel there is mutiple small braids occuring as the water flows around fallen logs from the active logging that is occuring on the site. 11) Two small logs acting as grade controls across the channel. 13) On the map the channel is shown as the top portion of the North Fork Blue Creek. 15) Approximately 6 inches or so of water flowing the the channel downstream and upstream portion has about 2-3 inches. 16) Several locations in the stream bed had bunches of leaves. 19) Within an old WWII training area so was instructed not to dig for safety reasons. 20) Three of the three times had fiborous roots in the channel. 28) Small amount of soft rush in channel near where the channel enters into a wetland.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/30/2021 9:30
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Tullahoma
Site Name/Description: Ephemeral 5 and Ditch 3 / SR Tullahoma		
Site Location: WWC located in the southeastern portion of the project site. Flows into an old beaver pond near a roadway		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.341685/-86.260778
Previous Rainfall (7-days) : In the previous 7 days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 10

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.25 inches in the previous seven days.

This WWC is located directly adjacent to a roadway. It starts at an old logging or agricultural roadway and flows down into an old unactive beaver pond.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =3)	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	1	2	3
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 = 3.50)	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 =3.50)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Very little bed and bank for a large portion of the channel. The downstream portion had about 6inches or so of bed and bank (near where the channel flows into the beaver pond). 2). Curves around a pfo wetland.Hugs the outside edge of a wetland. 4) A majority of the stream consists as the same substrate as the surrounding bank (sandy soil substrate). 11). Two spots in middle of the stream with logs acting as grade controls. 19). Pulled twice within the stream channel, soils were not hydric. 20). Three out of the three times I dug in the channel I was able to pull up fiborous roots. 21) There are red maples roots flowing across the channel bed throughout the entire channel. 25) 5 scuds after moderately searching. 28) Near the portion that hugs the wetland there were some bladder sedges within the channel bed, however this was in a very small portion of the channel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/17/21, 8:57
Assessors/Affiliation: Karsen Williams, Diana Gu		Project ID : SRC Moore
Site Name/Description: Ditch 1		
Site Location: Ditch 1 located in southeast side of study area, east of Wetland 7		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345949, -86.270659
Previous Rainfall (7-days) : 0.15"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass		**WWC**
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ditch

Secondary Indicator Score (if applicable) = 4

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. No water in channels or rain within last 7 days.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 0.5)	**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	2	3
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 = 1.5)	**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	0.5	Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Width 3', depth 0-.5', substrate is mucky loam.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 12:30
Assessors/Affiliation: Ben Burdette and Diana Gu/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 7, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.359191/ -86.263108
Previous Rainfall (7-days) :In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 10.5

Justification / Notes :

This is a drainaged that goes through a wetland.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 4)	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	1	2	3
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 = 2.5)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 0 to 1 foot and bank width ranged from 1 to 4 feet. 4) Substrate within WWC consisted of only mud.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 13:00
Assessors/Affiliation: Ben Burdette and Diana Gu/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 8, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.359243/-86.263447
Previous Rainfall (7-days) :In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : logging occured throughout the entire site		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 13

Justification / Notes :

This ephemeral is an old ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =5.5)	**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	1	2	3
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 = 3.5)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 0 to 1 foot and bank width ranged from 1 to 4 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 16:00
Assessors/Affiliation: Ben Burdette and Vonni Moore/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 9 and Ephemeral 10, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.361552/-86.286310
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**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	1	2	3
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 = 1.5)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 2 to 4 feet and bank width ranged from 1 to 2 feet. 4) Substrate within the channel consisted of an organic silt material similar to the bank.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/21/2021 13:30
Assessors/Affiliation: Diana Gu and James Young/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 11 - Ephemeral 20, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.85 inches		

Precipitation this Season vs. Normal : very wet wet average dry drought unknown

Source of recent & seasonal precip data : ESRL and AHPS

Watershed Size : Rock Creek; 27,028.41 acres | Photos: Y or N (circle) Number :

Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes Source: USDA: Web Soil Survey

Surrounding Land Use : Heavy logging and agricultural activites surround these WWC's

Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) :
Severe Moderate Slight Absent

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, 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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 9.25

Justification / Notes : All of these ephemerals are similar in structure, function, and location. Based on this they have been combined within this form.

In the past 48 hours it rained 0.10 inches. All channels were dry at the time of the investigation and appeared to primarily flow following runoff events.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =6)	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	1	2	3
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 = 1.25)	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 = 2)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 4). Sorting of substrates only is occuring due to flushing activities. 12). Each of these WWC's is located within a natural valley which is why we get the WWC's forming.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/21/2021 9:08
Assessors/Affiliation: Lyranda Thiem and James Young/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 17, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.46613/-86.292924
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, 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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 13.50

Justification / Notes : Channel was dry at the time of the investigation and looked to primilary flow due to run off events. In the past 48 hours it rained 0.10 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10.50)	**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	1	2	3
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 = 1)	**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 = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Some areas not well defined; choked by vegetation. 3) No water present but structure of channel Shows signs of little/small riffle pool sequences. 4) Bed substrate was pretty consistent within the channel looks to have more of a substract characteristic of flushing events. 12) Follow natural riverine. 13) Although this is a mapped blueline stream this top portion has been determined to have characterisitcs of a WWC.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 10:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 21, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345873/-86.302449
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

This Ephemeral is a roadside ditch

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 2)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 2 feet and a bank width of 0 to 1 foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 11:30
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ditch 2 and Ditch 3, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345873/-86.302449
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ditch

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 2)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 2 feet and a bank width of 0 to 1 foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:31
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 22		
Site Location: WWC32, connects with Stream 26 and Wetland 17, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349176, -86.299857
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 9

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 6-1', width 1-2'. Substrate consists of gravel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 5:15
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 23		
Site Location: Ephemeral 23, connects with Ephemeral 27, culvert, and Stream 20, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350460, -86.301304
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	0.5	1	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-6'. Substrate consists of gravel, semi-sorted, mostly silty sand. Old relict channel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 5:15
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 24		
Site Location: EPH 24, connects with EPH 23, culvert, and Stream 20, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350847, -86.301737
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	0.5	1	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-6'. Substrate consists of gravel, semi-sorted, mostly silty sand. Old relict channels.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 10:00
Assessors/Affiliation: Vonnie Moore and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 25, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.357892/-86.306756
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.5)	**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	1	2	3
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 = 1.5)	**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 = 6.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of 2 to 4 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 12:00
Assessors/Affiliation: Vonnie Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 26, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352317/-86.306786
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : logging occured around throughout this study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

This ephemeral is heavily vegetated and dry.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 1.5)	**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 = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 feet to 4 feet and a bank width of 2 to 6 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 14:00
Assessors/Affiliation: Vonni Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Ephemeral 27, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351485/-86.312067
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 8

Justification / Notes :

This ephemeral shows on the topo as a signifcant draw but is heavely vegetated.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 1)	**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 = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 28		
Site Location: EPH 28, connects with Stream 24 and culvert, located in western portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352041, -86.306589
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 10

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	0.5	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-2'. Substrate consists of gravel and silty substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 10:07
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 29		
Site Location: EPH 29, connects with Stream 26 and Wetland 17, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351378, -86.311801
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral 29

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 5)	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	1	2	3
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 = 1)	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 = 3.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	2.5 1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth<1', width 1-2'. Substrate consists of unsorted cobble and gravel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 30		
Site Location: EPH 30, connects with Stream 24, located in western portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352041, -86.306589
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 10

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	0.5	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-2'. Substrate consists of gravel and silty substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 31		
Site Location: Ephemeral 31, connects with Stream 24, and Wetland 18, located in southwestern portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.347407, -86.310973
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 2.5)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1.5'-2.5, width <1'. Substrate consists of gravel andsand

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: Ephemeral 32		
Site Location: EPH 32, connects with Stream 24, and Wetland 18, located in southwestern portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.346898, -86.312150
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Ephemeral

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 2.5)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1.5'-2.5, width <1'. Substrate consists of gravel andsand

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/29/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP1

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): Small Valley Local relief (concave, convex, none): Flat (none) Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.355725 Long: -86.251167 Datum: NAD83

Soil Map Unit Name: Ta, Taft NWI classification: PEM/PSS

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland had been previosuly clear cutt but has been either recovered or is still recovering. A large majority of the wetland floor was also covered in spagnum moss.
The Antecedent Precipitation Tool indicates that conditions are wetter than normal.
This data point is representative of jurisdictional Wetland 1.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Primary hydrology indicators are present.

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

Sampling Point: DP1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	40	Yes	FAC
2. *Rubus argutus*	5	No	FACU
3. *Viburnum nudum*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Herb Stratum (Plot size: 5)			
1. *Andropogon virginicus*	30	Yes	OBL
2. *Carex sp.**	30	Yes	FACW
3. *Andropogon glomeratus*	15	No	FACW
4. *Scirpus cyperinus*	10	No	FACW
5. *Ludwigia alternifolia*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover:	18

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	60	x 2 =	120
FAC species	40	x 3 =	120
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	150 (A)		335 (B)

Prevalence Index = B/A = 2.23

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydric Vegetation is Present
*Species indicator status range OBL-UPL. Assigned FACW status for wetland/upland determination.

SOIL

Sampling Point: DP1

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
0-20	10YR 5/1	95	10YR 5/6	5	C	PL/M	Loamy/Clayey	silty 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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present. .

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/29/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP2

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): Small Valley Local relief (concave, convex, none): Flat, none Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.35610813 Long: -86.25196163 Datum: NAD83

Soil Map Unit Name: Ta, Taft NWI classification: Upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of the upland area near jurisdictional Wetland 1, Wetland 2, Wetland 3, and Wetland 4.
The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Rubus argutus*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Herb Stratum (Plot size: 5)			
1. *Andropogon virginicus*	40	Yes	FACU
2. *Solidago sp.**	20	Yes	FACU
3. *Lepidium didymum*	5	No	UPL
4. *Dichanthelium clandestinum*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
**Species indicator status range OBL-UPL. Assigned FACU status for wetland/upland determination.

SOIL

Sampling Point: DP2

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
0-20	10YR 6/3	80	10YR 6/8	20	C	M	Loamy/Clayey	silty 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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present. Soil was very dry.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/28/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 3

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 5-10

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.354827 Long: -86.249055 Datum: NAD83

Soil Map Unit Name: MoB, Mountain View 0-2% slopes NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This is a wetland directly adjacent to a perennial stream. This data point is representative of jurisdictional Wetland 2.
The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Primary hydrology indicators are present.

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

Sampling Point: DP 3

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	20	Yes	FAC
2. *Liriodendron tulipifera*	10	Yes	FACU
3. *Liquidambar styraciflua*	10	Yes	FAC
4.			
5.			
6.			
7.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	40	Yes	FAC
2. *Rhododendron periclymenoides*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Herb Stratum (Plot size: 5)			
1. *Glyceria striata*	30	Yes	OBL
2. *Dichanthelium clandestinum*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Woody Vine Stratum (Plot size: 5)			
1. *Vitis rotundifolia*	30	Yes	FAC
2. *Simlax rotundifolia*	10	Yes	FAC
3.			
4.			
5.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	125	x 3 =	375
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	165 (A)		445 (B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydric Vegetation is Present

SOIL

Sampling Point: DP 3

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
0-20	10YR 5/2	90	10YR 5/6	10	C	M	Loamy/Clayey	silty 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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present. .

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 04/27/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP4

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillslide Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.35133509 Long: -86.25416804 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data points is representative of jurisdictional Wetland 3.
The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 7
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 4

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP4

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	50	Yes	FAC
2. *Liquidambar styraciflua*	15	No	FAC
3. *Quercus alba*	15	No	FACU
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	15	Yes	FAC
2. *Liquidambar styraciflua*	10	Yes	FAC
3. *Quercus phellos*	2	No	FAC
4. *Vaccinium corymbosum*	2	No	FACW
5.			
6.			
7.			
8.			
9.			
	29	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Carex intumescens*	5	Yes	FACW
2. *Smilax rotundifolia*	10	Yes	FAC
3. *Plantago subulata*	10	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	7	x 2 =	14
FAC species	102	x 3 =	306
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	134 (A)		390 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP4

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 5/2	80	10YR 5/6	20	C	M	Loamy/Clayey	Silty Clay
6-10	10YR 6/1	60	10YR 5/6	40	C	M	Loamy/Clayey	Silty Clay
10-20	10YR 6/1	60	10YR 5/8	40	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/19/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 5

Investigator(s): Karsen Williams and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.350072 Long: -86.245533 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO/PSS1

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is part of a large wetland complex. This data point is representative of jurisdictional Wetland 4.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 5

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	20	Yes	FAC
2. *Quercus alba*	20	Yes	FACU
3. *Quercus phellos*	10	Yes	FAC
4.			
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Sapling/Shrub Stratum (Plot size: 15)			
1. *Vaccinium corymbosum*	35	Yes	FACW
2. *Acer rubrum*	20	Yes	FAC
3. *Liquidambar styraciflua*	5	No	FAC
4. *Nyssa sylvatica*	5	No	FAC
5. *Quercus phellos*	5	No	FAC
6.			
7.			
8.			
9.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Herb Stratum (Plot size: 5)			
1. *Carex douglasii*	50	Yes	FAC
2. *Sphagnum sp.*	25	Yes	FACW
3. *Carex granularis*	15	No	FACW
4. *Andropogon virginicus*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	92	=Total Cover	
50% of total cover: 46		20% of total cover:	19

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

Wetland vegetation is present

SOIL

Sampling Point: DP 5

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
0-3	10YR 4/3	98	10YR 5/8	2	C	M	Loamy/Clayey	Prominent redox concentrations
3-20	10YR 5/2	70	10YR 5/8	30	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/20/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 6

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.341312 Long: -86.261173 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: Upland

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This data point is representative of upland area near Wetland 5.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ____ 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)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

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 hydrology is not present.

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

Sampling Point: DP 6

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	65	Yes	FACU
2. *Acer rubrum*	10	No	FAC
3. *Nyssa sylvatica*	5	No	FAC
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus alba*	30	Yes	FACU
2. *Liquidambar styraciflua*	15	Yes	FAC
3. *Acer rubrum*	10	No	FACU
4. *Ligustrum sinense*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
	60	=Total Cover	
50% of total cover: 30		20% of total cover:	12

Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	110	x 4 =	440
UPL species	0	x 5 =	0
Column Totals:	150 (A)		560 (B)

Prevalence Index = B/A = 3.73

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 6

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 4/2	100					Loamy/Clayey	
6-20	10YR 5/3	98	10YR 5/6	2	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/30/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 7

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.341096 Long: -86.261463 Datum: NAD83

Soil Map Unit Name: Ta, Taft NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is directly adjacent to a stream and maitained loggiong road. This data point is representative of jurisdictional Wetland 5. The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- ___ 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)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Primary hydrology indicators are present.

Other: Root channels and highly present sphagnum moss was observed throughout the wetland.

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

Sampling Point: DP 7

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	30	Yes	FAC
2. *Nyssa biflora*	20	Yes	FACW
3. *Acer rubrum*	10	No	FAC
4. *Quercus alba*	10	No	FACU
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	50	Yes	FAC
2. *Acer rubrum*	10	No	FAC
3. *Rhododendron periclymenoides*	10	No	FAC
4. *Vaccinium arboreum*	10	No	FACU
5.			
6.			
7.			
8.			
9.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Herb Stratum (Plot size: 5)			
1. *Carex intumescens*	30	Yes	FACW
2. *Glyceria striata*	20	Yes	OBL
3. *Osmunda regalis*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	50	x 2 =	100
FAC species	135	x 3 =	405
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	225 (A)		605 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydric Vegetation is Present

SOIL

Sampling Point: DP 7

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
0-1	10YR 3/3	100					Loamy/Clayey	silty loam
1-8	10YR 4/1	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
8-20	10YR 5/1	98	10YR 5/6	2	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present. .

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/20/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 8

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.340076 Long: -86.266689 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 6.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.
Surface water is present nearby.

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

Sampling Point: DP 8

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	20	Yes	FAC
2. *Nyssa sylvatica*	15	Yes	FAC
3. *Acer rubrum*	10	No	FAC
4. *Liquidambar styraciflua*	10	No	FAC
5.			
6.			
7.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	15	Yes	FAC
2. *Rubus occidentalis*	10	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Herb Stratum (Plot size: 5)			
1. *Andropogon virginicus*	40	Yes	FACU
2. *Eleocharis palustris*	40	Yes	OBL
3. *Leersia oryzoides*	20	No	OBL
4. *Juncus tenuis*	15	No	FAC
5. *Solidago gigantea*	10	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	125	=Total Cover	
50% of total cover: 63		20% of total cover:	25

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

Wetland vegetation is present

SOIL

Sampling Point: DP 8

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
0-3	10YR 5/2	95	10YR 5/8	5	C	PL	Loamy/Clayey	Prominent redox concentrations
3-20	2.5Y 6/2	95	5YR 5/8	5	C	PL	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/20/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 9

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.344424 Long: -86.268061 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 6.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 9

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Andropogon virginicus*	70	Yes	FACU
2. *Sorghastrum nutans*	40	Yes	FACU
3. *Solidago gigantea*	30	No	FACW
4. *Ambrosia psilostachya*	15	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	155	=Total Cover	
50% of total cover:	78	20% of total cover:	31

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	15	x 3 =	45
FACU species	110	x 4 =	440
UPL species	0	x 5 =	0
Column Totals:	155 (A)		545 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

Wetland vegetation is present

SOIL

Sampling Point: DP 9

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
0-20	2.5Y 4/3	97	10YR 5/6	3	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/21/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 10

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.344533 Long: -86.272910 Datum: NAD83

Soil Map Unit Name: Gutherie Silt Loam (Gu) NWI classification: PFO1A

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 7.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X 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)
- ___ 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)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes X	No ___	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 10

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Herb Stratum (Plot size: 5)			
1. *Carex intumescens*	40	Yes	FACW
2. *Carex sylvatica*	25	Yes	FACU
3. *Andropogon virginicus*	20	No	FACU
4. *Carex douglasii*	15	No	FAC
5. *Sphagnum carolinianum*	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	110	=Total Cover	
50% of total cover:	55	20% of total cover:	22

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

Wetland vegetation is present

SOIL

Sampling Point: DP 10

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	10YR 4/2	100					Loamy/Clayey	
4-20	2.5Y 5/1	85	10YR 5/6	15	C	M	Mucky Loam/Clay	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/21/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 11

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.344728 Long: -86.272160 Datum: NAD83

Soil Map Unit Name: Guthrie Silt Loam (Gu) NWI classification: Upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 7.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 11

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium myrtillus*	2	No	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	2	=Total Cover	
50% of total cover:	1	20% of total cover:	1

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex panicea*	5	Yes	UPL
2. *Plantago lanceolata*	5	Yes	UPL
3. *Sorghastrum nutans*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	=Total Cover	
50% of total cover:	8	20% of total cover:	3

Woody Vine Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover:	5	20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	5	x 4 =	20
UPL species	10	x 5 =	50
Column Totals:	25 (A)		100 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

Wetland vegetation is present

SOIL

Sampling Point: DP 11

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
0-20	2.5Y 4/3	97	10YR 5/6	3	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/14/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 12

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.343637 Long: -86.276530 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: -

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 8.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 12

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	30	Yes	FAC
2. *Quercus nigra*	15	Yes	FAC
3. *Acer rubrum*	10	No	FAC
4.			
5.			
6.			
7.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus phellos*	20	Yes	FAC
2. *Quercus nigra*	5	No	FAC
3. *Juniperus virginiana*	5	No	FACU
4. *Liquidambar styraciflua*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Herb Stratum (Plot size: 5)			
1. *Carex douglasii*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

Wetland vegetation is present

SOIL

Sampling Point: DP 12

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
0-3	10YR 4/2	100					Loamy/Clayey	
3-20	10YR 5/1	95	10YR 5/8	5	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/14/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 13

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.346221 Long: -86.276038 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 8.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 13

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	30	Yes	FACU
2. *Acer rubrum*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Sapling/Shrub Stratum (Plot size: 15)			
1. *Prunus serotina*	10	Yes	FACU
2. *Vaccinium myrtillus*	10	Yes	FAC
3. *Quercus laurifolia*	5	No	FACW
4. *Liquidambar styraciflua*	5	No	FAC
5. *Quercus alba*	5	No	FACU
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Herb Stratum (Plot size: 5)			
1. *Solidago gigantea*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 13

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	10YR 4/2	100					Loamy/Clayey	
4-20	10YR 5/3	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 14

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.358382 Long: -86.262876 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) NWI classification: PFO1C

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 9.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ 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** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 14

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	15	Yes	FAC
2. *Liriodendron tulipifera*	2	No	FACU
3.			
4.			
5.			
6.			
7.			
	17	=Total Cover	
50% of total cover: 9		20% of total cover:	4

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liriodendron tulipifera*	50	Yes	FACU
2. *Myrica cerifera*	20	Yes	FAC
3. *Prunus serotina*	10	No	FACU
4. *Acer rubrum*	5	No	FAC
5. *Quercus alba*	2	No	FACU
6. *Quercus phellos*	2	No	FAC
7.			
8.			
9.			
	89	=Total Cover	
50% of total cover: 45		20% of total cover:	18

Herb Stratum (Plot size: 5)			
1. *Chasmanthium sessiliflorum*	30	Yes	FAC
2. *Sphagnum carolinianum*	15	Yes	UPL
3. *Rubus occidentalis*	10	No	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Woody Vine Stratum (Plot size: 5)			
1. *Vitex rotundifolia*	10	Yes	UPL
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	77	x 3 =	231
FACU species	64	x 4 =	256
UPL species	35	x 5 =	175
Column Totals:	176 (A)		662 (B)

Prevalence Index = B/A = 3.76

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 14

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	2.5Y 5/4	80	10YR 6/8	20	C	M	Loamy/Clayey	Prominent redox concentrations
2-20	10YR 5/3	90	7.5YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 15

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.360161 Long: -86.263010 Datum: NAD83

Soil Map Unit Name: Guthrie Silt Loam (Gu) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 9.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 15

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	20	Yes	FACU
2. *Acer rubrum*	15	Yes	FAC
3. *Quercus alba*	5	No	FACU
4. *Oxydendrum arboreum*	5	No	UPL
5. *Carya tomentosa*	3	No	UPL
6.			
7.			
	48	=Total Cover	
50% of total cover: 24		20% of total cover:	10

Sapling/Shrub Stratum (Plot size: 15)			
1. *Oxydendrum arboreum*	15	Yes	UPL
2. *Cornus amomum*	5	Yes	FACW
3. *Vaccinium myrtillus*	5	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Herb Stratum (Plot size: 5)			
1. *Sassafras albidum*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Woody Vine Stratum (Plot size: 5)			
1. *Vitis rotundifolia*	10	Yes	FAC
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 15

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	10YR 3/6	100					Loamy/Clayey	
10-20	10YR 5/6	100					Loamy/Clayey	

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/14/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 16

Investigator(s): Ben Burdette and Vonni Moore/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillslide Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.3621250977 Long: -86.26130136 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is a forested wetland system. This data point is representative of jurisdictional wetland 10.
The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 16
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 16

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	50	Yes	FAC
2. *Quercus laurifolia*	25	Yes	FACW
3. *Quercus nigra*	5	No	FAC
4. *Liquidambar styraciflua*	5	No	FAC
5. *Liriodendron tulipifera*	5	No	FACU
6.			
7.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover:	18

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	5	Yes	FAC
2. *Liquidambar styraciflua*	5	Yes	FAC
3. *Quercus phellos*	5	Yes	FAC
4. *Quercus alba*	5	Yes	FACU
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	15	Yes	FAC
2. *Osmunda regalis*	15	Yes	FAC
3. *Osmundastrum cinnamomeum*	10	Yes	FACW
4. *Carex spp.*	5	No	FACW
5. *Sparganium americanum*	5	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 88.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	40	x 2 =	80
FAC species	105	x 3 =	315
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	160 (A)		440 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 16

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
0-14	10YR 5/1	90	10YR 5/6	10	C	M	Loamy/Clayey	Silt Loam
14-20	10YR 6/1	85	7.5YR 5/8	15	C	M	Loamy/Clayey	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/14/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 17

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.340076 Long: -86.266689 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 10.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 17

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	25	Yes	FACU
2. *Liriodendron tulipifera*	15	Yes	FACU
3. *Liquidambar styraciflua*	10	No	FAC
4. *Acer rubrum*	10	No	FAC
5. *Quercus rubra*	10	No	FACU
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus alba*	20	Yes	FACU
2. *Quercus rubra*	5	No	FACU
3. *Salix nigra*	5	No	OBL
4. *Rhododendron canescens*	5	No	FACW
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 5)			
1. *Vitis rotundifolia*	10	Yes	FAC
2. *Smilax rotundifolia*	10	Yes	FAC
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

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: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	125 (A)		435 (B)

Prevalence Index = B/A = 3.48

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 17

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
0-18	7.5YR 6/2	98	7.5YR 5/4	2	C	M	Loamy/Clayey	Distinct redox concentrations
18-20	7.5YR 6/3	90	7.5YR 6/6	10	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 18

Investigator(s): Ben Burdette and Vonni Moore Section, Township, Range: _____

Landform (hillside, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.36316264 Long: -86.27108 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 11.
The Antecedent Precipitation Tool indicates conditions are normal.

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)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 18

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3. *Quercus phellos*	30	Yes	FAC
4. *Nyssa sylvatica*	10	No	FAC
5.			
6.			
7.			
	100	=Total Cover	
50% of total cover: 50		20% of total cover:	20

Sapling/Shrub Stratum (Plot size: 15)			
1. *Pinus taeda*	5	No	FAC
2. *Liquidambar styraciflua*	25	Yes	FAC
3. *Nyssa sylvatica*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Herb Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2. *Carex spp.*	5	Yes	FACW
3. *Sphagnum spp.*	5	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	150	x 3 =	450
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	160 (A)		470 (B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 18

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	7.5YR 3/2	100					Loamy/Clayey	
2-20	7.5YR 5/2	85	7.5YR 4/6	15	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 06/14/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 19

Investigator(s): Ben Burdette and Vonni Moore Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.36316264 Long: -86.27108 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: Upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland area near Wetland 11. The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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** X

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

Remarks:
Wetland hydrology is not present.

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

Sampling Point: DP 19

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	50	Yes	FACU
2. *Quercus rubra*	40	Yes	FACU
3. *Liquidambar styraciflua*	10	No	FAC
4.			
5.			
6.			
7.			
	100	=Total Cover	
50% of total cover: 50		20% of total cover:	20

Sapling/Shrub Stratum (Plot size: 15)			
1. *Pinus taeda*	15	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3. *Llex opaca*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Herb Stratum (Plot size: 5)			
1. *Vaccinium corymbosum*	5	Yes	FACW
2. *Smilax rotundifolia*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	65	x 3 =	195
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	170 (A)		605 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 19

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 5/2	100					Loamy/Clayey	
2-20	10YR 5/4	98	10YR 4/6	2	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 20

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): Wetland Complex Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.3556689 Long: -86.283479 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is part of a large wetland complex. This data point is representative of jurisdictinal Wetland 12. The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 20

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Quercus phellos*	35	Yes	FAC
3. *Quercus bicolor*	5	No	FACW
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus phellos*	15	Yes	FAC
2. *Acer rubrum*	12	Yes	FAC
3. *Liquidambar styraciflua*	5	No	FAC
4. *Vaccinium darrowii*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
	37	=Total Cover	
50% of total cover: 19		20% of total cover:	8

Herb Stratum (Plot size: 5)			
1. *Carex debilis*	20	Yes	FAC
2. *Sphagnum sp.*	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	132	x 3 =	396
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	167 (A)		466 (B)

Prevalence Index = B/A = 2.79

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 20

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 5/2	95	10YR 5/6	5	C	M	Silty Clay Loam	
6-20	10YR 5/2	80	10YR 5/8	20	C	M	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 21

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): Concave Slope (%): 4%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.356664 Long: -86.281617 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: Upland

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This is and upland area positioned between recently logged area and a large wetland complex. This data point is representative of upland area near Wetland 12. The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ____ 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)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

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** X

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

Remarks:
Wetland hydrology is not present.

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

Sampling Point: DP 21

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Quercus phellos*	12	No	FAC
3. *Quercus bicolor*	5	No	FACW
4. *Quercus rubra*	15	Yes	FACU
5.			
6.			
7.			
	72	=Total Cover	
50% of total cover: 36		20% of total cover:	15

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	30	Yes	FAC
2. *Sassafras albidum*	15	Yes	FACU
3. *Vaccinium corymbosum*	10	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Herb Stratum (Plot size: 5)			
1. *Sassafras albidum*	20	Yes	FACU
2. *Aster amellus*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	87	x 3 =	261
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	157 (A)		501 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 21

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 4/3	100					Clay Loam	
2-10	10YR 5/2	90	10YR 5/6	10	C	M	Silty clay Loam	
10-20	10YR 5/2	80	10YR 5/8	20	C	M	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/20/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 22

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): Wetland Complex Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.355894 Long: -86.274517 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) and Taft Silt Loam (Ta) NWI classification: PEM

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is part of a large wetland complex. This wetland is representative of jurisdictional Wetland 13. The Antecedent Precipitation Tools indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 22

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Juncus tenuis*	40	Yes	FAC
2. *Sphagnum sp.*	50	Yes	FACW
3. *Andropogon gerardii*	20	No	FAC
4. *Juncus biflorus*	10	No	FACW
5. *Panicum amarum*	5	No	FACU
6. *Galeopsis tetrahit*	5	No	FACU
7.			
8.			
9.			
10.			
11.			
	130	=Total Cover	
50% of total cover:	65	20% of total cover:	26

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	60	x 3 =	180
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	130 (A)		340 (B)

Prevalence Index = B/A = 2.62

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 22

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
0-5	10YR 4/1	95	7.5YR 4/4	5	C	M	Mucky Loam/Clay	Prominent redox concentrations
5-10	10YR 5/2	92	7.5YR 4/6	8	C	PL/M	Mucky Loam/Clay	Prominent redox concentrations
10-24	10YR 5/2	80	7.5YR 5/6	20	C	M	Mucky Loam/Clay	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/20/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 23

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): flat Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.356550 Long: -86.273429 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) NWI classification: Upland

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This upland point is on the edge if a clear-cut area, elevated aboved the abutting wetland. This point is in an highly impacted area. This data point is representative of the upland data point to Wetland 13. The Antecedent Precipitation Tool indicates conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 hydrology is not present.

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

Sampling Point: DP 23

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus aboriginum*	10	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	10	=Total Cover	
50% of total cover:	5	20% of total cover:	2

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Poa spp.*	20	Yes	FACU
2. *Solidago gigantea*	15	Yes	UPL
3. *Andropogon gerardii*	15	Yes	FAC
4. *Erythronium albidum*	5	No	FACU
5. *Juncus tenuis*	2	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	57	=Total Cover	
50% of total cover:	29	20% of total cover:	12

Woody Vine Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover:	5	20% of total cover:	2

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	27	x 3 =	81
FACU species	25	x 4 =	100
UPL species	25	x 5 =	125
Column Totals:	77 (A)		306 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 23

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
0-1	10YR 4/2	100					Loamy/Clayey	Loam
1-12	10YR 5/3	80	7.5YR 5/8	20	C	M	Loamy/Clayey	Silty Clay Loam
12-20	2.5Y 5/4	85	7.5YR 5/8	15	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 24

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillslide Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.352897 Long: -86.279347 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is a forested wetland system that enters the area of investigation and extends upslope. This wetland eventually forms a stream where is dissapates into the channel. This data point is representative of jurisdictional Wetland 14. The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ 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** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 24

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	50	Yes	FAC
2. *Acer rubrum*	10	No	FAC
3. *Quercus laurifolia*	5	No	FACW
4.			
5.			
6.			
7.			
	65	=Total Cover	
50% of total cover: 33		20% of total cover:	13

Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus phellos*	20	Yes	FAC
2. *Acer rubrum*	2	No	FAC
3. *Quercus laurifolia*	2	No	FACW
4. *Quercus stellata*	1	No	UPL
5.			
6.			
7.			
8.			
9.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Herb Stratum (Plot size: 5)			
1. *Sparganium americanum*	45	Yes	OBL
2. *Juncus tenuis*	25	Yes	FACW
3. *Carex intumescens*	12	No	FACW
4. *Carex debilis*	10	No	FAC
5. *Eleocharis palustris*	8	No	OBL
6. *Carex granularis*	8	No	FACW
7. *Scirpus cyperinus*	2	No	FACW
8. *Galium hispidulum*	2	No	UPL
9.			
10.			
11.			
	112	=Total Cover	
50% of total cover: 56		20% of total cover:	23

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	53	x 1 =	53
FACW species	54	x 2 =	108
FAC species	92	x 3 =	276
FACU species	0	x 4 =	0
UPL species	3	x 5 =	15
Column Totals:	202 (A)		452 (B)

Prevalence Index = B/A = 2.24

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 24

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
0-3	2.5Y 5/2	98	10YR 5/6	2	C	M	Loamy/Clayey	Silty Clay Loam
3-26	2.5Y 5/2	90	10YR 5/6	10	C	M	Loamy/Clayey	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/18/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 25

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): flat Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.359279 Long: -86.278268 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) NWI classification: Upland

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This upland point is on the edge if a clear-cut area, elevated aboved the abutting wetland. This point is in an highly impacted area. This data point is representative of upland area near Wetland 14. The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ____ 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)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

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 hydrology is not present.

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

Sampling Point: DP 25

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus palustris*	80	Yes	FAC
2. *Juniperus virginiana*	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	100	=Total Cover	
50% of total cover: 50		20% of total cover:	20

Sapling/Shrub Stratum (Plot size: 15)			
1. *Paulownia tomentosa*	10	Yes	UPL
2. *Liquidambar styraciflua*	10	Yes	FAC
3. *Liriodendron tulipifera*	10	Yes	FACU
4. *Rubus aboriginum*	5	No	UPL
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Herb Stratum (Plot size: 5)			
1. *Gaultheria procumbens*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	40	x 4 =	160
UPL species	15	x 5 =	75
Column Totals:	145 (A)		505 (B)

Prevalence Index = B/A = 3.48

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

* This upland site had been recently clear cut so all trees and vegetation removed minus the remaining remants.

SOIL

Sampling Point: DP 25

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
0-5	2.5Y 5/3	100					Loamy/Clayey	Silty Clay Loam
5-24	2.5Y 5/4	100					Loamy/Clayey	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 26

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.349364 Long: -86.299783 Datum: NAD83

Soil Map Unit Name: Hawthorne-Sugargrove complex (HsC) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 15 and 16.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X 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)
- X 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)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 26

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carpinus caroliniana*	10	Yes	FAC
2. *Liriodendron tulipifera*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Sapling/Shrub Stratum (Plot size: 15)			
1. *Carpinus caroliniana*	20	Yes	FAC
2. *Arundinaria gigantea*	15	Yes	FACW
3. *Nyssa sylvatica*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Herb Stratum (Plot size: 5)			
1. *Thelypteris noveboracensis*	10	Yes	FAC
2. *Polystichum acrostichoides*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Woody Vine Stratum (Plot size: 5)			
1. *Arachis hypogaea*	5	Yes	UPL
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	55	x 3 =	165
FACU species	10	x 4 =	40
UPL species	5	x 5 =	25
Column Totals:	85 (A)		260 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 26

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
0-8	10YR 4/2	100					Mucky Loam/Clay	
8-20	2.5Y 5/1	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 27

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.349296 Long: -86.299817 Datum: NAD83

Soil Map Unit Name: Hawthorn-Sugargrove complex (HsC) NWI classification: upland

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 15 and 16.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 27

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fagus grandifolia*	40	Yes	FACU
2. *Liriodendron tulipifera*	20	Yes	FACU
3. *Quercus rubra*	10	No	FACU
4.			
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Sapling/Shrub Stratum (Plot size: 15)			
1. *Fagus grandifolia*	15	Yes	FACU
2. *Nyssa sylvatica*	2	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	17	=Total Cover	
50% of total cover: 9		20% of total cover:	4

Herb Stratum (Plot size: 5)			
1. *Polystichum acrostichoides*	20	Yes	FACU
2. *Thelypteris noveboracensis*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Woody Vine Stratum (Plot size: 5)			
1. *Arachis hypogaea*	10	Yes	UPL
2. *Smilax rotundifolia*	10	Yes	FAC
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	27	x 3 =	81
FACU species	105	x 4 =	420
UPL species	10	x 5 =	50
Column Totals:	142 (A)		551 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 27

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	10YR 4/2	100					Loamy/Clayey	
4-20	10YR 5/3	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 28

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.351528 Long: -86.311020 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) NWI classification: PFO1

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 17.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X 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** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 28

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3. *Quercus phellos*	10	No	FAC
4. *Cornus amomum*	10	No	FACW
5. *Carya tomentosa*	5	No	UPL
6.			
7.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover:	17

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	15	Yes	FAC
2. *Acer rubrum*	15	Yes	FAC
3. *Nyssa sylvatica*	10	No	FAC
4. *Ligustrum sinense*	5	No	FACU
5. *Vaccinium myrtillus*	5	No	FAC
6. *Juniperus virginiana*	2	No	FACU
7.			
8.			
9.			
	52	=Total Cover	
50% of total cover: 26		20% of total cover:	11

Herb Stratum (Plot size: 5)			
1. *Microstegium vimineum*	15	Yes	FAC
2. *Carex echinata*	15	Yes	OBL
3. *Carex intumescens*	10	Yes	FACW
4. *Solidago gigantea*	10	Yes	FACW
5. *Rosa multiflora*	10	Yes	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	60	=Total Cover	
50% of total cover: 30		20% of total cover:	12

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 90.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 28

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	10YR 4/2	100					Loamy/Clayey	
4-8	2.5Y 5/2	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
8-20	10YR 5/2	80	10YR 5/8	20	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 29

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.351392 Long: -86.310927 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near Wetland 17.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 29

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya tomentosa*	30	Yes	UPL
2. *Quercus alba*	30	Yes	FACU
3. *Acer rubrum*	10	No	FAC
4. *Nyssa sylvatica*	10	No	FAC
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Juniperus virginiana*	15	Yes	FACU
2. *Liquidambar styraciflua*	5	Yes	FAC
3. *Carya tomentosa*	5	Yes	UPL
4. *Nyssa sylvatica*	5	Yes	FAC
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Chasmanthium sessiliflorum*	20	Yes	FAC
2. *Toxicodendron radicans*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 5)			
1. *Vitis rotundifolia*	10	Yes	FAC
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 29

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
0-8	2.5Y 4/3	100					Loamy/Clayey	
8-20	2.5Y 5/3	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/16/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 30

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.347506 Long: -86.315926 Datum: NAD83

Soil Map Unit Name: Guthrie Silt Loam (Gu) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional Wetland 18.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 30

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liriodendron tulipifera*	15	Yes	FACU
2. *Liquidambar styraciflua*	10	Yes	FAC
3. *Quercus phellos*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover:	15	20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Carex echinata*	40	Yes	OBL
2. *Leersia oryzoides*	20	Yes	OBL
3. *Andropogon virginicus*	15	No	FACU
4. *Ludwigia alternifolia*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
50% of total cover:	43	20% of total cover:	17

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 30

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	7.5YR 3/2	100					Loamy/Clayey	
2-6	7.5YR 5/1	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
6-20	7.5YR 5/1	85	7.5YR 5/8	15	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Moore City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 31

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.347130 Long: -86.316905 Datum: upland

Soil Map Unit Name: Guthrie silt loam (Gu) NWI classification: upland

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
his data point is representative of upland near Wetland 18 and near non-jurisdictional Wetland 10 and 11.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 31

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	30	Yes	FAC
2. *Juniperus virginiana*	20	Yes	FACU
3. *Fagus grandifolia*	15	Yes	FACU
4. *Cornus amomum*	10	No	FACW
5.			
6.			
7.			
	75	=Total Cover	
50% of total cover: 38		20% of total cover:	15

Sapling/Shrub Stratum (Plot size: 15)			
1. *Fagus grandifolia*	15	Yes	FACU
2. *Liquidambar styraciflua*	10	Yes	FAC
3. *Carya tomentosa*	10	Yes	UPL
4. *Liriodendron tulipifera*	5	No	FACU
5. *Ligustrum sinense*	2	No	FACU
6.			
7.			
8.			
9.			
	42	=Total Cover	
50% of total cover: 21		20% of total cover:	9

Herb Stratum (Plot size: 5)			
1. *Chasmanthium sessiliflorum*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	70	x 3 =	210
FACU species	57	x 4 =	228
UPL species	10	x 5 =	50
Column Totals:	147 (A)		508 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 31

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	7.5YR 5/3	100					Loamy/Clayey	
2-20	10YR 5/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/27/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP32

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.343217 Long: -86.256126 Datum: NAD83

Soil Map Unit Name: MoB, Mountain View 0-2% slopes NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
This wetland does not have normal circumstances because the area has been clear cut in the past year (aeriel imagery shows a forested wetland still), used for potential staging location, burned, and the soils are compacted due to logging activities. This data point is representaive of non-jurisdictional wetland 1. The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 24
Water Table Present?	Yes X	No ___	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Primary hydrology indicators are present.

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

Sampling Point: DP32

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*			FAC
2. *Quercus sp.*			
3. *Acer sp.*			
4. *Pinus taeda*			FAC
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1. *Ligustrum sinense*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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)

X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
No percentages were given for the species identified in the wetland due the vegetation being signficantly disturbed.

SOIL

Sampling Point: DP32

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
0-12	10YR 5/2	95	10YR 5/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present. Only dug to 12 inches because we hit the high water table.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 4/27/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 33

Investigator(s): Jessica Tisdale and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.343008 Long: -86.256564 Datum: NAD83

Soil Map Unit Name: MoB, Mountain View 0-2% slopes NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Sampled area has been clear cutt and burned due to active logging. This data point is representative of upland area near non-jurisdictional Wetland 1. The Antecedent Precipitation Tool indicates that conditions are wetter than normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 33

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Poaceae sp.**	20	Yes	FACU
2. *Barbarea vulgaris*	20	Yes	FACU
3. *Ranunculus sp.*	10	No	
4. *Allium oleraceum*	5	No	UPL
5. *Geranium carolinianum*	5	No	UPL
6. *Oxalis debilis*	5	No	UPL
7.			
8.			
9.			
10.			
11.			
	65	=Total Cover	
50% of total cover:	33	20% of total cover:	13

Woody Vine Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	45	x 4 =	180
UPL species	15	x 5 =	75
Column Totals:	60 (A)		255 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
HydricVegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP 33

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
0-20	10YR 5/4	90	10YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/18/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 34

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.354891 Long: -86.262807 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of jurisdictional non-jurisdictional Wetland 2.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X 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** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 34

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Herb Stratum (Plot size: 5)			
1. *Andropogon virginicus*	15	Yes	FACU
2. *Solidago gigantea*	15	Yes	FACW
3. *Dichanthelium clandestinum*	5	No	FAC
4. *Juncus diffusissimus*	5	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40	=Total Cover	
50% of total cover:	20	20% of total cover:	8

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	15	x 3 =	45
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	50 (A)		145 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 34

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						
4-6	2.5Y 5/2	100						
6-20	2.5Y 5/2	80	2.5Y 5/6	20	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/18/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 35

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.344728 Long: -86.272160 Datum: NAD83

Soil Map Unit Name: Guthrie Silt Loam (Gu) NWI classification: Upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near non-Jurisdictional Wetland 2.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 35

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium myrtillus*	2	No	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover:	1

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex panicea*	5	Yes	UPL
2. *Plantago lanceolata*	5	Yes	UPL
3. *Sorghastrum nutans*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Woody Vine Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	5	x 4 =	20
UPL species	10	x 5 =	50
Column Totals:	25 (A)		100 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 35

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
0-20	2.5Y 4/3	97	10YR 5/6	3	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/21/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 36

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.346249 Long: -86.269121 Datum: NAD83

Soil Map Unit Name: Mountainview Silt Loam (MoA) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional Wetland 3 and 4.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 36

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	50	Yes	FAC
2. *Quercus phellos*	20	Yes	FAC
3. *Juniperus virginiana*	10	No	FACU
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Nyssa sylvatica*	20	Yes	FAC
2. *Acer rubrum*	15	Yes	FAC
3. *Liquidambar styraciflua*	10	Yes	FAC
4. *Juniperus virginiana*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
	47	=Total Cover	
50% of total cover: 24		20% of total cover:	10

Herb Stratum (Plot size: 5)			
1. sphagnum spp.	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	155	x 3 =	465
FACU species	12	x 4 =	48
UPL species	0	x 5 =	0
Column Totals:	167 (A)		513 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 36

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
0-20	2.5Y 5/2	70	10YR 5/8	30	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
X Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 5/21/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 37

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.346107 Long: -86.268532 Datum: upland

Soil Map Unit Name: Mountview silt loam (MoB) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
his data point is representative of upland near non-jurisdictional Wetland 3 and 4.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 37

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	20	Yes	FACU
2. *Juniperus virginiana*	20	Yes	FACU
3. *Quercus phellos*	5	No	FAC
4.			
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	10	Yes	FAC
2. *Ligustrum sinense*	10	Yes	FACU
3. *Juniperus virginiana*	10	Yes	FACU
4. *Vaccinium myrtillus*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	30	Yes	FAC
2.			
3.			
4.			
5.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	110 (A)		390 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 37

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
0-20	2.5Y 6/4	100					Loamy/Clayey	

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 38

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.340101 Long: -86.279718 Datum: NAD83

Soil Map Unit Name: Taft Silt Loam (Ta) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional Wetland 5.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X 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** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 38

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	Yes	FAC
2. *Nyssa sylvatica*	30	Yes	FAC
3. *Acer rubrum*	10	No	FAC
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Nyssa sylvatica*	5	Yes	FAC
3. *Salix nigra*	2	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
	17	=Total Cover	
50% of total cover: 9		20% of total cover:	4

Herb Stratum (Plot size: 5)			
1. *Carex intumescens*	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 38

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 4/2	98	10YR 5/8	2	C	M	Loamy/Clayey	Prominent redox concentrations
6-20	10YR 5/2	90	10YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 39

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.340210 Long: -86.280557 Datum: upland

Soil Map Unit Name: Taft silt loam (Ta) NWI classification: upland

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
his data point is representative of upland near non-jurisdictional Wetland 5.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 39

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	30	Yes	FAC
2. *Quercus alba*	30	Yes	FACU
3. *Acer rubrum*	10	No	FAC
4. *Quercus phellos*	5	No	FAC
5.			
6.			
7.			
	75	=Total Cover	
50% of total cover: 38		20% of total cover:	15

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	20	Yes	FAC
2. *Nyssa sylvatica*	15	Yes	FAC
3. *Ligustrum sinense*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Herb Stratum (Plot size: 5)			
1. *Chasmanthium sessiliflorum*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 39

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
0-3	10YR 3/2	100					Loamy/Clayey	
3-20	10YR 5/3	98	10YR 5/6	2	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/18/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 40

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.359333 Long: -86.278268 Datum: NAD83

Soil Map Unit Name: Mountview Silt Loam (MoB) NWI classification: PEM

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This is a roadside wetland that is interconnected with a nearby larger PFO weltand (Wetland 16) and is seperated by an access road. There is a burried culvert in the access road. This data point is representative of non-jurisdictional wetland 6. The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 40

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Scirpus atrovirens*	30	Yes	OBL
2. *Juncus tenuis*	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	=Total Cover	
50% of total cover:	30	20% of total cover:	12

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		90 (B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 40

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
0-3	2.5Y 5/2	98	10YR 5/6	2	C	M	Loamy/Clayey	Prominent redox concentrations
3-20	2.5Y 5/3	90	10YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
20-26	2.5Y 6/2	60	10YR 5/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/18/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 41

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): Concave Slope (%): 4%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.359279 Long: -86.278268 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: Upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This upland point is on the edge if a clear-cut area, elevated aboved the abutting wetland. This point is in an highly impacted area. This data point is representative of upland area near non-jurisdictional wetland 6. The Antecedent Precipitation Tool indicates conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 hydrology is not present.

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

Sampling Point: DP 41

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	8	Yes	FAC
2. *Acer rubrum*	5	Yes	FAC
3. *Pteridium aquilinum*	3	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover: 8		20% of total cover: 4	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	13	x 3 =	39
FACU species	3	x 4 =	12
UPL species	0	x 5 =	0
Column Totals:	16 (A)		51 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

* This upland site had been recently clear cut so all trees and vegetation removed minus the remaining remants.

SOIL

Sampling Point: DP 41

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
0-5	2.5Y 5/3	100					Loamy/Clayey	Silty Clay Loam
5-24	2.5Y 5/4	100					Loamy/Clayey	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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 05/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 42

Investigator(s): Ben Burdette and Vonni Moore Section, Township, Range: _____

Landform (hillside, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.3556689 Long: -86.283479 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: PFO

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional wetland 7. The Antecedent Precipitation Tool indicates conditions are normal.

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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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** X **No** ____

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 42

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Sapling/Shrub Stratum (Plot size: 15)			
1. *Oxydendrum arboreum*	5	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Herb Stratum (Plot size: 5)			
1. *Carex lurida*	5	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	40 (A)		120 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 42

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 3/2	100					Loamy/Clayey	
2-20	10YR 5/1	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 06/17/2021

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 43

Investigator(s): James Young and Lyranda Thiem/ HDR Section, Township, Range: _____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): Concave Slope (%): 4%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.35944536 Long: -86.28317393 Datum: NAD83

Soil Map Unit Name: Guthrie silt loam (Gu) and Taft Silt Loam (Ta) NWI classification: Upland

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

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

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This data point is representative of upland area near Non-Jurisdictional Wetland 7 data point. The Antecedent Precipitation Tool indicates conditions are normal.

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)
- ____ 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)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

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 hydrology is not present.

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

Sampling Point: DP 43

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	25	Yes	FACU
2. *Pinus taeda*	25	Yes	FAC
3. *Quercus rubra*	10	No	FACU
4. *Liquidambar styraciflua*	5	No	FAC
5.			
6.			
7.			
	65	=Total Cover	
50% of total cover: 33		20% of total cover:	13

Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer rubrum*	30	Yes	FAC
2. *Sassafras albidum*	15	Yes	FACU
3. *Vaccinium corymbosum*	10	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover:	11

Herb Stratum (Plot size: 5)			
1. *Rubus aboriginum*	10	Yes	UPL
2. *Oxydendrum arboreum*	5	Yes	FACU
3. *Liquidambar styraciflua*	5	Yes	FAC
4. *Quercus phellos*	5	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Woody Vine Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	75	x 3 =	225
FACU species	55	x 4 =	220
UPL species	10	x 5 =	50
Column Totals:	150 (A)		515 (B)

Prevalence Index = B/A = 3.43

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 43

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	7.5YR 3/3	100					Loamy/Clayey	
4-20	7.5YR 5/3	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 44

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.353547 Long: -86.305541 Datum: NAD83

Soil Map Unit Name: Mountview Silt Loam (MoA) NWI classification: PEM

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional Wetland 8.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 44

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Carex echinata*	60	Yes	OBL
2. *Panicum anceps*	20	No	FAC
3. *Eleocharis palustris*	15	No	OBL
4. *Diospyros virginiana*	10	No	FAC
5. *Typha latifolia*	10	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
	115	=Total Cover	
50% of total cover: 58		20% of total cover:	23

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	85	x 1 =	85
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		175 (B)

Prevalence Index = B/A = 1.52

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 44

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
0-8	2.5Y 5/2	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations
8-20	10YR 5/2	85	10YR 5/6	15	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/17/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 45

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.353256 Long: -86.305783 Datum: upland

Soil Map Unit Name: Mountview silt loam (MoA) NWI classification: upland

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
his data point is representative of upland near non-jurisdictional Wetland 8.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 45

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Glycine max*	85	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
50% of total cover:	43	20% of total cover:	17

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	85	x 5 =	425
Column Totals:	85 (A)		425 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point: DP 45

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
0-20	10YR 5/2	98	10YR 5/8	2	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/16/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 46

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.352983 Long: -86.313696 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) NWI classification: -

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional Wetland 9.
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 46

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Nyssa sylvatica*	20	Yes	FAC
2. *Quercus phellos*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Sapling/Shrub Stratum (Plot size: 15)			
1. *Nyssa sylvatica*	10	Yes	FAC
2. *Cephalanthus occidentalis*	10	Yes	OBL
3. *Quercus phellos*	5	No	FAC
4. *Liquidambar styraciflua*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
	27	=Total Cover	
50% of total cover: 14		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Dulichium arundinaceum*	40	Yes	OBL
2. *Carex intumescens*	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2. *Carex intumescens*			FACW
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 46

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 3/2	100					Loamy/Clayey	
2-20	10YR 4/1	95	10YR 4/6	5	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/16/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 47

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-3%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.352874 Long: -86.313633 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (DkA) NWI classification: upland

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of upland near non-jurisdictional Wetland 9.
The Antecedent Precipitation Tool indicates that conditions are normal.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP 47

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya tomentosa*	30	Yes	UPL
2. *Quercus alba*	30	Yes	FACU
3. *Acer rubrum*	10	No	FAC
4. *Nyssa sylvatica*	10	No	FAC
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 15)			
1. *Juniperus virginiana*	15	Yes	FACU
2. *Liquidambar styraciflua*	5	Yes	FAC
3. *Carya tomentosa*	5	Yes	UPL
4. *Nyssa sylvatica*	5	Yes	FAC
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Chasmanthium sessiliflorum*	20	Yes	FAC
2. *Toxicodendron radicans*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 5)			
1. *Vitis rotundifolia*	10	Yes	FAC
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 47

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
0-8	2.5Y 4/3	100					Loamy/Clayey	
8-20	2.5Y 5/3	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 6/16/21

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 48

Investigator(s): Karsen Williams and Lyranda Thiem Section, Township, Range: _____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.347457 Long: -86.319065 Datum: NAD83

Soil Map Unit Name: Dickson silt loam (MoB) NWI classification: PFO

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This data point is representative of non-jurisdictional Wetland 10 and 11
The Antecedent Precipitation Tool indicates that conditions are normal.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ 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)
- X Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland Hydrology is present.

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

Sampling Point: DP 48

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Nyssa sylvatica*	20	Yes	FAC
2. *Quercus phellos*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Sapling/Shrub Stratum (Plot size: 15)			
1. *Nyssa sylvatica*	10	Yes	FAC
2. *Cephalanthus occidentalis*	10	Yes	OBL
3. *Quercus phellos*	5	No	FAC
4. *Liquidambar styraciflua*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
	27	=Total Cover	
50% of total cover: 14		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Dulichium arundinaceum*	40	Yes	OBL
2. *Carex intumescens*	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2. *Carex intumescens*			FACW
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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
- X 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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 48

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 3/2	100					Loamy/Clayey	
2-20	10YR 4/1	95	10YR 4/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[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) **(LRR N)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

Hydric soil indicators are present.

July 22, 2021

Mr. Eddie Gordon
TDEC Division of Water Resources
Columbia Environmental Field Office
1421 Hampshire Pike
Columbia, TN 38401

Subject: SR Tullahoma Solar Project
Hydrologic Determination Request
Tullahoma, Moore County, Tennessee

To Whom it May Concern:

A subsidiary of Silicon Ranch Corporation (SRC), SR Tullahoma, LLC (SR Tullahoma), intends to develop a site in Moore County, Tennessee, as a solar photovoltaic (PV) facility. The study area assessed for development of the facility ("Project Area") encompasses 3,463 acres north of Cobb Hollow Road, south of Old Shelbyville Highway, east of Wooley Road, and west of Cumberland Avenue (Appendix A, Figures 1 and 2). The Project Area partially overlaps the former Motlow Range, a World War II training area, on which the U.S. Army Corps of Engineers (USACE) periodically conducts remediation of unexploded ordnances (UXOs). On behalf of SR Tullahoma, SRC has authorized HDR, Inc. (HDR) as its agent to submit the enclosed Hydrologic Determination (HD) request for written approval from the Tennessee Department of Environmental Conservation (TDEC) regarding the extent of wet weather conveyance (WWC) features within the Project Area.

	Requester	Consultant/Requester	Current Property Owners
Name	Conor Goodson	Kelly Thames, PWS, TN-QHP 1192-TN29	See Figure 3 (Appendix A)
Affiliation	Silicon Ranch Corporation	HDR	
Mailing Address	222 Second Avenue Suite 1900 Nashville, TN 37201	440 S. Church Street Suite 1000 Charlotte, NC 28202	
Phone Number	404-759-8626	704-338-6710	

Project Location: North and South of Lynchburg Hwy, West of Tullahoma, TN in Moore County, TN
Basin: Elk River Watershed [Hydrologic Unit Code (HUC) 060300030405], Elk River Watershed [HUC 060300030402], and Mulberry Creek [HUC 060300030502]
City: City of Tullahoma
County: Moore County
Center Decimal Degree Coordinates of Project Area: 35.350738°, -86.273682°
USGS Quadrangle Name: Tullahoma, TN and Lynchburg East, TN

Project Area Description and Recent Weather Conditions

Land use within the Project Area consists of primarily of agricultural land with forested field margins, planted forested areas, maintained transmission rights-of-way, and drainageways (Appendix A, Figure 3). Dominant woody species consist of red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipfera*), sweet gum (*Liquidambar styraciflua*), red oak (*Quercus falcata*), white oak (*Quercus alba*), and willow oak (*Quercus phellos*). The understory is composed primarily of red maple, sweet gum, black raspberry (*Rubus sp.*), and highbush blueberry (*Vaccinium corymbosum*). Herbaceous and vine species include greenbriar (*Smilax rotundifoloa*), greater bladder sedge (*Carex intumescens*), limestone meadow sedge (*Carex granularis*), broom sedge (*Andropogon virginicus*), and bushy blue stem (*Andropogon glomeratus*). Heavy logging is currently occurring throughout the largest parcel of the Project Area. Further, as mentioned above, the Project Area is partially within the former Motlow Range, a World War II-era training facility, on which the USACE periodically conducts remediation of UXOs.

According to the Natural Resources Conservation Services (NRCS) Soil Survey of Moore County (Appendix A, Figure 4), on-site soils consist of 14 soils map units; these are summarized in Appendix C, Table1. The NRCS National Hydric Soils List classifies Lee silt loam (Lb) and Gutherie silt loam (Gu) as hydric for Moore County (Appendix B).

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) depicts the potential presence of wetlands within the Project Area (Appendix A, Figures 5A and 5B). The U.S Geological Survey (USGS) National Hydrography Dataset (NHD) maps a network of surface waters and catchments of the U.S. The USGS NHD also depicts the potential presence of a number of stream channels within the Project Area (Appendix A, Figure 5A and 5B).

The Project Area is located in the Elk River Watershed (HUC 060300030405), Elk River Watershed (HUC 060300030402), and Mulberry Creek (HUC 060300030502) (Appendix A, Figure 6). Hurricane Creek drains south from the Project Area to its confluence with the Elk River approximately four miles south of the Project Area. North Fork Blue Creek and West Fork Rock Creek drain southwest into its confluence with the Elk River approximately eight miles south of the Project Area.

Precipitation data were reviewed in accordance with TDEC Division of Water Pollution Control Guidance for Making Hydrologic Determinations (Version 1.4) prior to field mobilizations to determine the baseline hydrologic conditions at the time of the field survey. Based on TDEC guidance, weather conditions for the Project Area were identified as Average at the time of the April, May, and June field surveys. Tables 1, 2, and 3 (below) summarize the recent weather conditions for the Project Area for the three-month period prior to each field mobilization.

Table 1. Precipitation Data Evaluation for the Month of April

April 2021 Mobilization			
Criteria - values are in inches	**1st Month Prior** March 2021	**2nd Month Prior** February 2021	**3rd Month Prior** January 2021
Standard Deviation	2.92	2.49	3.14
Minus 1 Std. Deviation	3.17	2.35	2.20
Normal Precipitation	6.09	4.84	5.34
Plus 1 Std. Deviation	9.01	7.33	8.48
Actual Estimated Rainfall	10.0	6.0	2.0
Condition (elevated, low, average)	Elevated	Average	Low
Condition Value	3	2	1
Month Weight Value	3	2	1
Product of Previous Two Rows	9	4	1
		Sum*:	**14**
		Condition Value:	**Average**

* 6 to 9 (Abnormally Dry), 10 to 14 (Average), and 15 to 18 (Abnormally Wet)

Table 2. Precipitation Data Evaluation for the Month of May

May 2021 Mobilization			
Criteria - values are in inches	**1st Month Prior** March 2021	**2nd Month Prior** February 2021	**3rd Month Prior** January 2021
Standard Deviation	2.54	2.92	2.49
Minus 1 Std. Deviation	2.20	3.17	2.34
Normal Precipitation	4.76	6.09	4.83
Plus 1 Std. Deviation	7.30	9.01	7.32
Actual Estimated Rainfall	4.0	10.0	6.0
Condition (elevated, low, average)	Normal	Elevated	Normal
Condition Value	2	3	2
Month Weight Value	3	2	1
Product of Previous Two Rows	6	6	2
		Sum*:	**14**
		Condition Value:	**Average**

* 6 to 9 (Abnormally Dry), 10 to 14 (Average), and 15 to 18 (Abnormally Wet)

Table 3. Precipitation Data Evaluation for the Month of June

June 2021 Mobilization			
Criteria - values are in inches	**1st Month Prior** March 2021	**2nd Month Prior** February 2021	**3rd Month Prior** January 2021
Standard Deviation	2.15	2.54	2.92
Minus 1 Std. Deviation	2.37	2.20	3.17
Normal Precipitation	4.52	4.76	6.09
Plus 1 Std. Deviation	6.67	7.30	9.01
Actual Estimated Rainfall	6.0	4.0	10.0
Condition (elevated, low, average)	Normal	Normal	Elevated
Condition Value	2	2	3
Month Weight Value	3	2	1
Product of Previous Two Rows	6	4	3
		Sum*:	**13**
		Condition Value:	**Average**

* 6 to 9 (Abnormally Dry), 10 to 14 (Average), and 15 to 18 (Abnormally Wet)

Delineation of Wetlands and Waters

On April 26 to 30, May 17 to 21, and June 14 to 18, 2021, HDR environmental scientists Ben Burdette, Wetland Professional In Training (WPIT) and Tennessee Qualified Hydrologic Professional In Training (TN-QHP-IT); Diana Gu; Lyranda Thiem, TN-QHP-IT; Jessica Tisdale, Certified Ecologist; Karsen Williams; and James Young, Professional Wetland Scientist (PWS), conducted field delineations of the Project Area for waters of the U.S., as defined under Section 404 of the Clean Water Act. Waters of the U.S. were delineated according to the methodology and guidance described in the USACE 1987 Wetland Delineation Manual, the 2020 Navigable Waters Protection Rule, and the 2012 USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0). Streams were classified utilizing the methodology and guidance provided in Regulatory Guidance Letter (RGL) 05-05 and the TDEC Division of Water Pollution Control Guidance for Making Hydrologic Determinations (Version 1.4) (TDEC 2011). Waters of the U.S were mapped using a Trimble® Geo7X GPS unit capable of sub-meter accuracy. GPS points were post-processed utilizing Trimble® GPS Pathfinder Office Software.

In addition, on-site WWCs, which are not considered jurisdictional by the USACE, were delineated and classified using the TDEC Division of Water Pollution Control Guidance for Making Hydrologic Determinations (Version 1.4). These features were also mapped using a Trimble® Geo 7X GPS unit. Data Forms for jurisdictional and non-jurisdictional features can be found in Appendix G.

Results

The results of the on-site field investigation conducted by HDR indicate that there are 29 wetlands (558.48 acres), 30 streams (58,093 linear feet), three open waters (1.91 acres), and 35 WWCs (18,645 linear feet) located within the Project Area (Figure 7). A summary of waters within the Project Area is provided in Table 4 (below).

Table 4. Summary of On-Site Aquatic Resources

Type of Water	Flow Regime	Length (linear feet)	Area (acres)
USACE Jurisdictional Features			
Streams	Perennial	31,082	---
	Intermittent	27,011	---
Open Waters	---	---	1.91
Wetlands	---	---	555.35
	Total:	**58,093**	**557.26**
Non-Jurisdictional Features			
Wet Weather Conveyances	---	18,645	--
Open Waters	---	---	1.27
Wetlands	---	---	3.13
	Total:	**18,645**	**4.4**

Jurisdictional Features

On-site jurisdictional streams total approximately 58,093 linear feet and consist of 30 streams (Table 1, Appendix C). On-site jurisdictional open waters total approximately 1.91 acres and consist of three open waters (Table 2, Appendix C). On-site jurisdictional wetlands total 555.35 acres and consist of 18 wetlands (Table 3, Appendix C).

Figures are provided in Appendix A, Hydrologic Determination Field Data Sheets are provided in Appendix E, and representative photographs are provided in Appendix F.

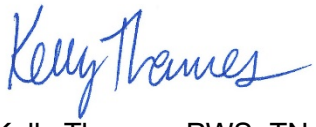
Non-Jurisdictional Features

There are four on-site non-jurisdictional open waters, totaling 1.27 acres (Table 1, Appendix D). There are 11 non-jurisdictional wetlands, totaling 3.13 acres (Table 2, Appendix D). On-site non-jurisdictional WWCs total approximately 18,645 linear feet and consist of 35 WWCs (Table 3, Appendix D).

Figures for jurisdictional and non-jurisdictional features are provided in Appendix A, Hydrologic Determination Field Data Sheets are provided in Appendix E, and representative photographs are provided in Appendix F

On behalf of Silicon Ranch Corporation, HDR is hereby requesting an HD for WWCs identified within the Project Area. Should you have any questions or require additional information following your review of the enclosed materials, please contact Karsen Williams at (404) 601-8681 (karsen.williams@hdrinc.com) or Kelly Thames at (704) 338-6710 (kelly.thames@hdrinc.com).

Sincerely,



Kelly Thames, PWS, TN-QHP
Environmental Project Manager

Karsen Williams
Environmental Scientist

Attachments:
Appendix A – Figures
Appendix B – Project Area Soils
Appendix C – Jurisdictional Features
Appendix D – Non-Jurisdictional Features
Appendix E – Hydrologic Determination Field Data Sheets
Appendix F – Photographs

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 14:10
Assessors/Affiliation: Lyranda Thiem- QHP-IT and Jessica Tisdale		Project ID : SRC Moore
Site Name/Description: Stream 1- Intermittent Stream		
Site Location: Perrenial stream located with a forested area near the northeast portion of the project		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.354437/ -86.247254
Previous Rainfall (7-days) : In the previous 7 days it rained 0.20 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 27.75

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 7 also was not used because it had rained in the previous four days (0.20 inch).

There is active logging occuring on this site. The logging has altered the length and flow of this channel due to logging vehicles being driven across the stream.

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	1	2	3
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 NA	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 27.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Evident bed and bank throughout the stream with the exception of a small portion in the upstream portion of the channel. 3) Most of the stream consisted of longer runs. 4). Two smaller sections where gravel substrate is sorting from the finner sandy substrates. 7). Near the start of the stream (upstream) there is one small braided sections consisting of two channels with an island in between. 11). Four plus small to medium sized logs across the channel bed acting as a grad control throughout the entire channel. 13). UNT to North Fork Creek; this mapped stream is smaller than what is originally mapped for the blue lined stream due to disruption by logging activities which included creating a logging road. The blue line now is mapped with the flow of another channel (labled SA3 during field survey). 15) Ranges from approximately 6 inches to 1 foot. 16) Leaf piles were observed downstream. 19). Due to being on an old WWII site we were instructed not to dig in certain areas, this being one of them. 20) 1 of 4 times digging fiborous roots were found. 21) Upstream portion of channel has some rooted sweetgum trees. 25). One fly larve (Diptera sp.) and 5 midges (not red midges). 26) Downstream portion of channel has a greater amount than upstream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 11:27
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 2- Perennial Stream		
Site Location: Perrenial stream located with a forested area near the northeast portion of the project		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351602/ -86.246583
Previous Rainfall (7-days) : In the previous 7 days it rained 0.20 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 33

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous four days (0.20 inch).

There is active logging occuring on this site. The logging has altered the flow of this channel due to logging vehicles driving across stream.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =16.25)	**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	1	2	3
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 = 6.5)	**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 =10.25)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 33

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Evident bed and bank throughout the entire stream. 3). In the upstream portion of the channel there are more runs than riffles and pools, however when heading downstream the riffle pool sequences become very previlent. 6) There were at least 3 medium sized bars throughout the channel. 7) Near the middle section of the stream there is one smaller braided area (with two channels and one island). 11). Several (3+) smaller logs have created grade controls throughout the channel. 12). The surrounding area of the stream is fairly flat. 15) Water within the channel ranges from 6 inches to about a foot of water. 18) Three spots across the channel that have medium to small drift lines. 20). 2 of the 5 diggigs contained fiborous roots. 24). Tadpoles were observed near the upstream portion of the stream but not downstream. 25). 3 damselfly larvae, 6 mayflies one stick forming caddisfly, 5 scuds, and 8 midges were observed with moderate amount of searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette-QHP-IT/ HDR		Project ID : SR Moore
Site Name/Description: Stream 3, Perennial Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 29

Justification / Notes : This stream runs through a forested region within the eastern portion of the project area.
In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 20)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 29

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 inches to 1 foot and a bank width of 6 to 8 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture of small gravel and clay. 7) Throughout the entirety of this stream there are multiple times the stream had many channels braiding for about five feet and then would come back into one. 11). Grade controls consisted of fallen logs (smaller) with only a couple (2-3) throughout the entire stream. 15). Water depth in the channel ranged from 6 inches to 1 foot. 20). Fiborous roots were located in the upstream portions of the stream. 24). Amphibians within the stream consisted of leapord frogs.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/26/2021 11:50
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 4- Intermittent Stream flows into blue lined stream		
Site Location: Intermittent stream located with a forested area near southeast portion of the project site.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350154/ -86.247431
Previous Rainfall (7-days) : In the previous 7 days it rained 1.45 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight **Absent**		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous seven days (1.45 inch).

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =10)	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	1	2	3
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 = 5.75)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal =6.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Strong bed/ bank (at least a foot) throughout the channel except for the very start/upstream portion of the channel. 2) Sinousity is absent, fairly straight channel that leads into North Fork Creek. 3) Two smaller portions of sorting between gravel substrates from the sandy substrates near the downstream portion of the channel. 4). About 10 to 20 feet of floodplain on the right hand bank side of stream and on the left hand side there is a 4-6 foot stream with floodplain after it. 11) 1 smaller logs across the channel acting as a grade control near the downstream portion of the channel. 25) Water level ranges from 2 to 6 inches throughout the stream. 19) This section was not completed because this project site lies in an old WWII site so we were given orders to not conduct any digging due to the possiblity of UXO objects. 20). 3 out 5 times there was fiborous roots within the channel bed. 23) Small red maple within the upstream portion. 33) Two crayfish adults found in moderate searching 24). One fingernail claim found in moderate searching. 25). One damselfly found with moderate searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/26/2021 13:15
Assessors/Affiliation: Lyranda Thiem-QHP-IT/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: Stream 5- Perennial Stream / SR Tullahoma		
Site Location: Perennial stream located with a forested area near southeast portion of the project site.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long:
Previous Rainfall (7-days) : In the previous 7 days it rained 1.45 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used because it had rained in the previous seven days (1.45 inch).

At this site there has been active logging by foresty. There are a couple of spots where the stream is interupted due to roads being built across them. Beavers have also been altering the water slightly with there dam about midway up the stream.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 21.5)	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	1	2	3
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 = 6)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 9.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Strong bed/ bank (at least a foot) throughout the channel except for the very start/upstream portion of the channel. 2) Sinousity is moderate as there are many meandering curves throughout the entire channel length. 4). There is evidence of sorting occuring throughout the downstream portion of the channel with the gravely substrates seperating from the sand. 5) 10 to 20 feet of floodplain throughout most of the channel. Near the upstream portion of the channel the floodplain is a little less between 5-10 feet. 6) Four fairly large bars throughout the stream. 8) Two larger alluvial deposits observed throughout the channel. 10&11) Two smaller headcuts and Several larger log and or rock grade controls throughout the channel. 13) Labeled as North Fork Blue Creek on maps.19) Due to being on an old WWII site we were instructed not to dig due to the potential for UXO objects below the surface. 20) 1 of 5 times had fiborous roots. 25) 1 mayfly and 10+ midges were observed with moderate searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/20/21, 5:14pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 6, Perennial Stream		
Site Location: Stream 6 drains W6 and flows southeast towards W5, located near W. Lincoln St.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.340926, -86.266513
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 35

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 17)	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	1	2	3
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 = 6.5)	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 = 11.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 35

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 0.6-2', width 2-8'. Sandy substrate with some gravel.
Amphibians: tadpoles, salamanders
Macros: Mayflies, 5+ scuds

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 7, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 29

Justification / Notes : This stream runs through a forested region within the eastern portion of the project area.
In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 29

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 inches to 1 foot and a bank width of 6 to 8 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture of small gravel and clay. 7) Throughout the entirety of this stream there are multiple times the stream had many channels braiding for about five feet and then would come back into one. 11). Grade controls consisted of fallen logs (smaller) with only a couple (2-3) throughout the entire stream. 15). Water depth in the channel ranged from 6 inches to 1 foot. 20). Fiborous roots were located in the upstream portions of the stream. 24). Amphibians within the stream consisted of leapord frogs.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/19/2021 9:00
Assessors/Affiliation: Lyranda Thiem and James Young/ HDR		Project ID : SR Moore
Site Name/Description: Stream 8, Perennial Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37

Justification / Notes :

Heavy logging occured near the downstream portion of the stream altering water regime. This stream was originally

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 19)	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	1	2	3
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 = 10)	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 = 8)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 25) water beetles (10+), scubs (3), fly larva (diptera)

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/18/2021 16:55
Assessors/Affiliation: Lyranda Thiem- QHP-IT/HDR and James Young/ HDR		Project ID : SR Moore
Site Name/Description: Stream 9, Intermittent Stream, Tullahoma Solar Project		
Site Location: Flows into Stream 8 located south of lynchburg highway		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.85 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21.75

Justification / Notes :

Heavy logging occured near the downstream portion of the stream altering water regime. This stream was originally mapped as a blue line stream, but flows primarily from the a nearby stream that has taken most of the flow. In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10.75)	**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	1	2	3
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 = 6)	**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)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 6 to 8 inches and a bank width of 2 to 4 feet. 2). The lower portion had increased sinuosity. 4). Bed substrate similar to bank substrate with little gravel intermixed. 10). No headcuts occured, but multiple medium sized logs acted as grade controls throughout the stream 13). Although it is mapped as a blue lined stream the flow primarly comes from a different nearby stream due to logging activities. Biology; no water occured in the stream so most of the biology section did not occur.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/28/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 10, Perennial Stream West Fork Rock Creek, Tullahoma Solar Project		
Site Location: USGS Blue Line stream labeled as West Fork Rock Creek, southeastern section of the project area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352369/-86.269557
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 41.5

Justification / Notes : This is a mapped blueline stream (West Fork Rock Creek) that runs through the eastern portion the project area. In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 24.5)	**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	1	2	3
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 = 9.0)	**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 = 8.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 41.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of 4 to 10 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a sand and gravel. 5) A floodplain wetland follows the stream from start to finish. 7) In the middle sections of the stream mutiple braided channels occur for about 5 feet. 11) No head cuts occur throughout the stream but various medium sized logs and boulders cross the stream acting as grade controls.13) This is a named blueline stream called West Fork Rock Creek.15) In the past 48 hours it rained 0 inches; water depth ranged from 6 inches to 2 feet. 24). Amphibians within the stream consisted of leapord frogs and green frogs. These were observed with a moderate amount of looking. 25) Macros included 3 water beetles, midges (10+), and rock caddisfly all with 10-15 minutes of looking.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 15:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Moore
Site Name/Description: Stream 11, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.356058/-86.266360
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23.5

Justification / Notes : This stream is a unnamed tributary to West Fork Rock Creek.

In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**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	1	2	3
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 = 7.5)	**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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 23.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 0.5 feet to 2 feet and a bank width of 2 to 4 feet. 2).Throughout the system the stream has sinousity. 4) Substrates within the stream consisted of mostly a silty substrate with a mixture mud. 5). A floodplain wetland surround this stream and West Fork Rock Creek.11) Grade controls within the stream conisted of two-three log across the stream. 15) Water depth in the channel ranged from 6 inches to a foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/18/21, 9:57am
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 12, Intermittent Stream		
Site Location: Stream 12 drains from W7 and flows northwest into Wetland 9		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344855, -86.273977
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu), Dickson silt loam, 0-2% slopes (DkA), Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 9)	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	1	2	3
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 = 8.5)	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)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <0.5-2', width 3-10'. Mucky loam substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 1:24pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 13, Intermittent Stream		
Site Location: Stream 13 blows out into W9		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344509, -86.276221
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Taft silt loam, 0-2% slopes (Ta)		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. Previously damned area.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**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	1	2	3
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 = 7)	**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 = 8)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <0.5', width 3'. Gravel and silty sand substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/15/2021 10:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT, Diana Gu		Project ID : SR Tullahoma
Site Name/Description: Stream 14, SR Tullahoma		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.361562, -86.286322 End: 35.362070, -86.293206
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes : See reverse.

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	1	2	3
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 = 6)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts from a WWC. Appears to have been ditched at some point. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and mud. Lower reaches have significant pools of water. No fish or obligate organisms identified. Headwaters for Hurricane Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/15/2021 11:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT, Diana Gu		Project ID : SR Tullahoma
Site Name/Description: Stream 15, Intermittent Stream		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.364109, -86.294654 End: 35.362129, -86.293685
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Guthrie silt loam (Gu)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight **Absent**		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19

Justification / Notes : See reverse.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 12)	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	1	2	3
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 = 3)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts off site. Dry bed but evidence of sediment on limited leaves in streambed. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and gravel. Evidence of significant flow events in the past.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/26/2021 16:50
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 16, Intermittent, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.342766/-86.293976
Previous Rainfall (7-days) : In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 24

Justification / Notes : This stream runs through a forested region within the southern portion of the project area.
In the past 48 hours it rained 0 inches.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 13)	**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	1	2	3
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 = 7)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 24

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 6 feet and a bank width of 2 to 6 feet. 2).Throughout the channel remains fairly sinous. 4) Sorting of cobble / rubble substrates from silty sand and gravel is common throughout the stream. 10) One headcut occuring where water reemerges after going underground for a ways 15) Water in channel ranged from 6 inches to a foot or more.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 13:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 17, Intermittent Stream, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.342783°/ -86.294005°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14)	**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	1	2	3
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 = 7.5)	**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 = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 2 feet and bank bank width ranged from 8 to 12 feet. 4) Sorting of cobble from gravel and silty substrate. 14) Multiple springs flow into this stream. 15) Water depth in channel ranged from 6 inches to 3 feet. 24) Three leapord frogs were found within the stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 13:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 18, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.344654°/ -86.296134°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.
Bank height ranged from 1 to 4 feet and bank width was 2 feet on both sides.

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	1	2	3
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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 12:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 19, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.344654°/ -86.296134°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : This meets the primary indicator 7 due to be fed by multiple springs.
Bank height ranged from 1 to 4 feet and bank width was 2 feet on both sides.

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	1	2	3
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 plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 11:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 20, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.356320°/ -86.303309°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes : 5) Obligate macros found include caddisflies and mayflies. 6) Fish were not key out to species, but was noted they were not gambusia. 7) Multiple springs occured along the length of the stream. Bank width ranged from 12 to 20 feet and bank height ranged from 4 to 15 feet.

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	1	2	3
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 = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:21pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 21, Perennial Stream		
Site Location: Stream 21 flows in from off-site, flows under Cumberland Springs Rd, and drains into Hurricane Ck		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349188, -86.299966
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Hawthorne-Sugargrove complex (HsC) and Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		**Stream**
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 37.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =17.5)	**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	1	2	3
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 = 7.5)	**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 =12.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 37.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1', width 8'. Cobble, muck, and sand substrate. Some sorting

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 4:25pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 22, Intermittent Stream		
Site Location: Begins as a spring and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.340820, -86.300408
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	1	2	3
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 = 7)	**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 =10)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth <1', width 0.5-4'. Cobble and gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:17pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 23, Intermittent Stream		
Site Location: Begins as a spring and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349864, -86.301438
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 15)	**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	1	2	3
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 = 7)	**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 = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 0.5-1', width 2-3'. Gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 3:58pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 24, Intermittent Stream		
Site Location: Drains W18, flows under road, and flows into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.344863, -86.313037
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En) on Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 26.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =16.5)	**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	1	2	3
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 = 6)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 26.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 2-5', width 3-10'. Cobble, gravel, and small rock substrate. Culvert under Cumberland Road.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 12:36pm
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 25, Intermittent Stream		
Site Location: Flows into site via double CMP culvert. Drains into Hurricane Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.356364, -86.303554
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Ennis gravelly silt loam, occasionally flooded (En)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		**Stream**
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**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	1	2	3
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 = 6.5)	**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 = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 23

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 2-3', width 8'. Gravel substrate. Some sorting. Spring fed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 10:12am
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: Stream 26, Intermittent Stream		
Site Location: Starts as WWC, develops into stream, and flows into Stream 25		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.351364, -86.311217
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Dickson silt loam, 0-2 percent slopes (DkA)		Source: USDA: Web Soil Survey
Surrounding Land Use : Naturally forested area; near active roadway; agricultural field nearby		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		**WWC**
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		**Stream**
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 15)	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	1	2	3
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 = 6)	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 = 6)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 27

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Depth 1-2', width 4-8'. Cobble and some gravel substrate.
Water in 2nd half of stream.
Tadpoles, green frogs, leopard frogs.
Stringy grass in channels.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 11:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 27, Intermittent Stream,Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.355811°/ -86.307554°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 9)	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	1	2	3
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 = 6)	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 = 6)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 3 feet and bank width ranged from 2 to 4 feet. 4) Sorting of gravel from sandy substrates.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 9:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: Stream 28 & Stream 29, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: 35.351364°/ -86.311217°
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.5

Justification / Notes : This meets the primary indicator 6 due to finding small mouth bass minnows in the channel. This stream form is representative of both stream 28 and 29 because they are the same stream just seperated by a wetland in the middle of them.

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	1	2	3
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 = 6.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 1 to 2 feet and bank bank width ranged from 2 to 4 feet. 4) Sorting of substrates was little; the only sorting that occured in this stream was silty substrates from mud.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore, TN	Named Waterbody: N/A	Date/Time: 6/16/2021 10:00 AM
Assessors/Affiliation: Ben Burdette, WPIT, QHP-IT		Project ID : SR Tullahoma
Site Name/Description: Stream 30, Intermittent Stream		
Site Location: East of Ledford Mill Road, north Lynchburg Highway; Tullahoma, TN		
USGS quad: Lynchburg East	HUC (12 digit): 060300030405	Lat/Long: Start: 35.363785, -86.302551 End: 35.363692, -86.302718
Previous Rainfall (7-days) : 0.78" - Tullahoma 4NE Station		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : USACE APT, TDEC WETS Tables, Tullahoma 4NE Station		
Watershed Size : 27.8 sq miles	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Dickson silt loam (DkA)		Source: USDA - Moore Cnty
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	-	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	-	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	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 *Gambusia*)	-	Stream
7. Presence of naturally occurring ground water table connection	-	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21

Justification / Notes : See reverse.

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	1	2	3
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 = 6)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Stream is blue line on USGS quad. Starts from a WWC. Appears to have been ditched at some point. Bank Height: 1 - 2', Bank Width: 4 - 6', substrate sand and mud. Lower reaches have significant pools of water. No fish or obligate organisms identified. Headwaters for Hurricane Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/28/2021 12:48
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Tullahoma
Site Name/Description: WWC1 / SR Tullahoma		
Site Location: WWC located in the top northeast portion of the project site. This WWC flows into a stream.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.353869/-86.245742
Previous Rainfall (7-days) : In the previous 7 days it rained 0.85 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 13.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 0.85 inches in the previous seven days. Channel was mostly dry except for the last 4 feet down -stream where is connects to a blue line stream.

There is active logging occuring upstream of site near the WWC and residential housing on the other side of the channel.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 9)	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	1	2	3
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 = 3.25)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 1)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bed and bank evident throughout the entire channel reach 2). The channel is fairly straight upstream, however as you move downstream it becomes much more sinous 3). There are a few (2) deeper pools along the channel. The channel was mostly dry during the time of the field survey. 4) Near the downstream portion of the channel there were two smaller spots were it looked like some gravely substrate was sorting from the sandy substrate. 7) Near the downstream portion where this channel enters a stream there is some braiding occuring (only two channels forming) 10). One large headcut in the middle of the channel. 11) There are several (4) smaller log grade controls throughout the channel. 12) The surrounding area is fairy flat with residential community on pne side and a logging site on the other. 15) The last 4-5 feet of stream had about 6 inches of standing water in the channel. 19) The soil was not checked because this site is on an old WWII training site so due to safelty reasons no digging could occur. However, the other streams across the site that were sampled on the same day contained water throughout the entire channel (at least 1 foot). 20) Each of the 5 digs contained fiborous routes.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/27/2021 18:00
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: WWC2/ SR Tullahoma		
Site Location: WWC located in the northeast portion of the project site. It flows from a wetland down across a logging road into a stream.		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355482/ -86.250589
Previous Rainfall (7-days) : In the previous 7 days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 8.25

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.35 inches in the previous seven days.

This WWC flows from a PEM/PSS wetland down across a logging road. A stream starts on the other side of the logging road.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =2)	**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	1	2	3
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 = 3.75)	**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 =2.50)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Some bed and bank within the middle section of the channel. No bed/bank upstream or downstream. 2). Better sinousity upstream before the road. 15). In the past 48 hours it rained 0.75 inches the amount of water within the channel is about 6 inches (middle section). The downstream section near the roadway was about 1-2 inches of water. 16) Multiple sections within the stream bed had bunches of leaves. 19). One of the three draws had hydric soils. The draw that had hydric soils flowed through a wetland. 20). Out of the three times dug each time I pulled up fiborous roots. 21) Near the upstream portion of the channel there was sedges within the channel bed. 25) 8+ scuds and 2 sow bugs were observed in the channel with moderate amount of searching.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/19/21, 1:38
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Moore
Site Name/Description: WWC3		
Site Location: WWC3 located in western side of study area, draining into North Fork Blue Creek		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.348854, -86.251279
Previous Rainfall (7-days) : No		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. No water in channels or rain within last 7 days.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 5)	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	1	2	3
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 = 3.5)	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 = 1)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : WWC flows into blueline N. Fork Blue Creek. Substrate consists of silty clay loam. Small logs across channel, vegetation is dominated by red maple across channel. Width about 2-4 feet, depth 6"-1'

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/27/2021 11:47
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Moore
Site Name/Description: WWC4/ SR Tullahoma		
Site Location: WWC located in the eastern portion of the project site. Flows into an intermittent stream		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350534/ -86.264781
Previous Rainfall (7-days) : In the previous 7 days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.35 inches in the previous seven days.

Active logging occured on both sides of the small forested region this channel is in.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 7.5)	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	1	2	3
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 = 3.5)	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 NA	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 1.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Very small banks (6 inches or so) throughout the entire channel. 2) Some sinousity as it meanders with the forested area. 7). Near the upstream portion the the channel there is mutiple small braids occuring as the water flows around fallen logs from the active logging that is occuring on the site. 11) Two small logs acting as grade controls across the channel. 13) On the map the channel is shown as the top portion of the North Fork Blue Creek. 15) Approximately 6 inches or so of water flowing the the channel downstream and upstream portion has about 2-3 inches. 16) Several locations in the stream bed had bunches of leaves. 19) Within an old WWII training area so was instructed not to dig for safety reasons. 20) Three of the three times had fiborous roots in the channel. 28) Small amount of soft rush in channel near where the channel enters into a wetland.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 4/30/2021 9:30
Assessors/Affiliation: Lyranda Thiem/HDR and Jessica Tisdale/HDR		Project ID : SRC Tullahoma
Site Name/Description: WWC5 and WWC 24/ SR Tullahoma		
Site Location: WWC located in the southeastern portion of the project site. Flows into an old beaver pond near a roadway		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.341685/-86.260778
Previous Rainfall (7-days) : In the previous 7 days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	NA	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 10

Justification / Notes :

Indicator 3 was not used for this determination due to being outside of the date range. Indicator 8 also was not used due it having rained 1.25 inches in the previous seven days.

This WWC is located directly adjacent to a roadway. It starts at an old logging or agricultural roadway and flows down into an old unactive beaver pond.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =3)	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	1	2	3
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 = 3.50)	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 =3.50)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Very little bed and bank for a large portion of the channel. The downstream portion had about 6inches or so of bed and bank (near where the channel flows into the beaver pond). 2). Curves around a pfo wetland.Hugs the outside edge of a wetland. 4) A majority of the stream consists as the same substrate as the surrounding bank (sandy soil substrate). 11). Two spots in middle of the stream with logs acting as grade controls. 19). Pulled twice within the stream channel, soils were not hydric. 20). Three out of the three times I dug in the channel I was able to pull up fiborous roots. 21) There are red maples roots flowing across the channel bed throughout the entire channel. 25) 5 scuds after moderately searching. 28) Near the portion that hugs the wetland there were some bladder sedges within the channel bed, however this was in a very small portion of the channel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 5/17/21, 8:57
Assessors/Affiliation: Karsen Williams, Diana Gu		Project ID : SRC Moore
Site Name/Description: WWC 6		
Site Location: WWC6 located in southeast side of study area, east of Wetland 7		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345949, -86.270659
Previous Rainfall (7-days) : 0.15"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass		**WWC**
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 4

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range. No water in channels or rain within last 7 days.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 0.5)	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	2	3
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 = 1.5)	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	0.5	Yes = 1.5	

C. **Biology** (Subtotal = 2)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Width 3', depth 0-.5', substrate is mucky loam.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 12:30
Assessors/Affiliation: Ben Burdette and Diana Gu/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 8, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.359191/ -86.263108
Previous Rainfall (7-days) :In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 10.5

Justification / Notes :

This is a drainaged that goes through a wetland.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =4)	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	1	2	3
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 = 2.5)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 0 to 1 foot and bank width ranged from 1 to 4 feet. 4) Substrate within WWC consisted of only mud.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 04/29/2021 13:00
Assessors/Affiliation: Ben Burdette and Diana Gu/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 9, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.359243/-86.263447
Previous Rainfall (7-days) :In the prevous seven days it rained 1.35 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : logging occured throughout the entire site		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 13

Justification / Notes :

This WWC is an old ditch.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =5.5)	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	1	2	3
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 = 3.5)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 0 to 1 foot and bank width ranged from 1 to 4 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 16:00
Assessors/Affiliation: Ben Burdette and Vonni Moore/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 10 and WWC 11, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.361552/-86.286310
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =4)	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	1	2	3
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 = 1.5)	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 = 4)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1) Bank height ranged from 2 to 4 feet and bank width ranged from 1 to 2 feet. 4) Substrate within the channel consisted of an organic silt material similar to the bank.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/21/2021 13:30
Assessors/Affiliation: Diana Gu and James Young/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC12 - WWC17, WWC19- WWC21, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.355728/-86.277608
Previous Rainfall (7-days) : In the prevous seven days it rained 0.85 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging and agricultural activites surround these WWC's		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, 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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9.25

Justification / Notes : All of these WWC's (WWC13, WWC14, WWC15, WWC16, WWC17, WWC19, WWC20, WWC21) are similar in structure, function, and location. Based on this they have been combined within this form.

In the past 48 hours it rained 0.10 inches. All channels were dry at the time of the investigation and appeared to primarily flow following runoff events.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =6)	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	1	2	3
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 = 1.25)	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 = 2)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 4). Sorting of substrates only is occuring due to flushing activities. 12). Each of these WWC's is located within a natural valley which is why we get the WWC's forming.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 05/21/2021 9:08
Assessors/Affiliation: Lyranda Thiem and James Young/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 18, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.46613/-86.292924
Previous Rainfall (7-days) : In the prevous seven days it rained 0.10 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, 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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 13.50

Justification / Notes : Channel was dry at the time of the investigation and looked to primilary flow due to run off events. In the past 48 hours it rained 0.10 inches.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =10.50)	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	1	2	3
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 = 1)	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 = 2)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Some areas not well defined; choked by vegetation. 3) No water present but structure of channel Shows signs of little/small riffle pool sequences. 4) Bed substrate was pretty consistent within the channel looks to have more of a substract characteristic of flushing events. 12) Follow natural riverine. 13) Although this is a mapped blueline stream this top portion has been determined to have characterisitcs of a WWC.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 10:00
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 22, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345873/-86.302449
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

This WWC is a roadside ditch

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 2)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 2 feet and a bank width of 0 to 1 foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/17/2021 11:30
Assessors/Affiliation: Daina Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 23 and WWC 24, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.345873/-86.302449
Previous Rainfall (7-days) :In the prevous seven days it rained 0.78 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 2)	**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 = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 foot to 2 feet and a bank width of 0 to 1 foot.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 2:31
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SRC Tullahoma
Site Name/Description: WWC 25		
Site Location: WWC32, connects with Stream 26 and Wetland 17, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.349176, -86.299857
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 6-1', width 1-2'. Substrate consists of gravel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 5:15
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 26		
Site Location: WWC26, connects with WWC27, culvert, and Stream 20, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350460, -86.301304
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	0.5	1	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-6'. Substrate consists of gravel, semi-sorted, mostly silty sand. Old relict channel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/14/21, 5:15
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 27		
Site Location: WWC27, connects with WWC26, culvert, and Stream 20, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.350847, -86.301737
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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	0.5	1	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-6'. Substrate consists of gravel, semi-sorted, mostly silty sand. Old relict channels.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 10:00
Assessors/Affiliation: Vonnie Moore and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 28, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.357892/-86.306756
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured throughout the study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.5)	**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	1	2	3
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 = 1.5)	**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 = 6.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of 2 to 4 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 12:00
Assessors/Affiliation: Vonnie Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 29, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352317/-86.306786
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : logging occured around throughout this study area		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

This WWC is heavily vegetated and dry.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	1	2	3
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 = 1.5)	**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 = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 1 feet to 4 feet and a bank width of 2 to 6 feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 06/16/2021 14:00
Assessors/Affiliation: Vonni Gu and Ben Burdette/ HDR		Project ID : SR Tullahoma
Site Name/Description: WWC 30, Tullahoma Solar Project		
Site Location: South of Lynchburg Highway, Tullahoma, TN		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351485/-86.312067
Previous Rainfall (7-days) :In the prevous seven days it rained 1.25 inches		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Heavy logging occured around the downstream portion of the stream		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 8

Justification / Notes :

This WWC shows on the topo as a signifcant draw but is heavely vegetated.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**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	1	2	3
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 = 1)	**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 = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1). Bank height ranged from 2 feet to 4 feet and a bank width of feet.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 31		
Site Location: WWC31, connects with Stream 24 and culvert, located in western portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352041, -86.306589
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 10

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	0.5	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-2'. Substrate consists of gravel and silty substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 10:07
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 32		
Site Location: WWC32, connects with Stream 26 and Wetland 17, located in southwest side of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.351378, -86.311801
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 5)	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	1	2	3
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 = 1)	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 = 3.5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	2.5 1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth<1', width 1-2'. Substrate consists of unsorted cobble and gravel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 33		
Site Location: WWC33, connects with Stream 24, located in western portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.352041, -86.306589
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 10

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**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	0.5	2	3
5. Active/relic floodplain	0	1	2	3
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 = 1)	**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 = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1-2', width 1-2'. Substrate consists of gravel and silty substrate

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 34		
Site Location: WWC34, connects with Stream 24, and Wetland 18, located in southwestern portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.347407, -86.310973
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 7)	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	1	2	3
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 = 2.5)	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 = 3)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1.5'-2.5, width <1'. Substrate consists of gravel andsand

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Moore	Named Waterbody: Hurricane Creek	Date/Time: 6/15/21, 4:04
Assessors/Affiliation: Karsen Williams, Lyranda Thiem		Project ID : SR Tullahoma
Site Name/Description: WWC 35		
Site Location: WWC35, connects with Stream 24, and Wetland 18, located in southwestern portion of study area		
USGS quad: Tullahoma/Lynchburg East	HUC (12 digit): 060300030402	Lat/Long: 35.346898, -86.312150
Previous Rainfall (7-days) : .58"		
Precipitation this Season vs. Normal : very wet wet **average** dry drought unknown Source of recent & seasonal precip data : ESRL and AHPS		
Watershed Size : Rock Creek; 27,028.41 acres	Photos: **Y** or N (circle) Number :	
Soil Type(s) / Geology : Mountview Silt Loam (MoB), 0 to 2 present slopes and Dickson Silt loam (DkA), 0 to 5 present slopes		Source: USDA: Web Soil Survey
Surrounding Land Use : Active logging in forested areas and agricultural fields		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		**WWC**
2. Defined bed and bank absent, dominated by upland vegetation / grass	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precipitation 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 STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 12.5

Justification / Notes : Indicator 3 was not used for this determination due to being outside of the date range.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 7)	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	1	2	3
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 = 2.5)	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 = 3)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
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	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Depth 1.5'-2.5, width <1'. Substrate consists of gravel andsand

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
COLUMBIA ENVIRONMENTAL FIELD OFFICE
1421 HAMPSHIRE PIKE
COLUMBIA, TENNESSEE 38401
PHONE (931) 380-3371 STATEWIDE 1-888-891-8332 FAX (931) 380-3397

September 1, 2021

Kelly Thames, PWS, TN-QHP# 1192-TN20
HDR. Inc.
1100 Peachtree Street, NE, Suite 400
Atlanta, GA 30309

Re: Hydrologic Determination Report
SR Tullahoma Solar Project
north of Cobb Hollow Road, south of Old Shelbyville Highway, east of Wooley Road, and west of Cumberland Avenue
Tullahoma, Tennessee

Dear Kelly Thames,

The Division of Water Resources (division) received a jurisdictional waters report submitted by you for a proposed SR Tullahoma Solar Project located at north of Cobb Hollow Road, south of Old Shelbyville Highway, east of Wooley Road, and west of Cumberland Avenue in Tullahoma, Tennessee. This project is within the Upper Duck Watershed.

Based on the information and documentation submitted, and the division's rules and guidance regarding hydrologic determinations, the division accepts the jurisdictional determinations of the drainage features as portrayed in the report.

Please be advised that hydrologic determinations are advised and governed by Tennessee Department of Environment and Conservation (TDEC) rules and regulations, and therefore only apply to the State's permitting process. Because these and other various water features on-site may potentially also be considered jurisdictional Waters of the United States, any alterations to them should only be performed after consultation with the U.S. Army Corps of Engineers.

Thank you for your interest in water quality in Tennessee. If you have any questions or need additional information, please contact me at 931-248-6073.

Sincerely,

Eddie Gordon

Environmental Scientist
Division of Water Resources

SR Tullahoma Transmission Line Upgrade WOUS Memo

Date:	Wednesday, March 16, 2022
Project:	Moore County Solar / SR Tullahoma
To:	Tennessee Valley Authority and Silicon Ranch Corporation (SRC)
From:	Karsen Williams and Lyranda Thiem, HDR, Inc.
Subject:	Summary of WOUS features for the transmission line upgrades associated with SR Tullahoma's Moore County Solar, Moore County, Tennessee

A subsidiary of Silicon Ranch Corporation (SRC), SR Tullahoma, LLC (SR Tullahoma), proposes to construct a photovoltaic solar facility known as Moore County Solar (Project) on approximately 3,463 acres in Moore County, Tennessee. The Project Area partially overlaps the former Motlow Range (World War II Training Area), on which the U.S. Army Corps of Engineers (USACE) periodically conducts remediation of unexploded ordnances. The Project would connect to the existing adjacent Franklin-Wartrace No. 2 161-kilovolt (kV) transmission line (TL) and require upgrades on this TL. HDR conducted a jurisdictional waters delineation survey for wetlands and streams in the TL upgrade areas, including TL right-of-way (ROW) and associated access routes necessary for crew and equipment access (Appendix A, Figure 1 and Figure 2). The TL upgrade areas are herein referred to as the "TL Study Area."

HDR reviewed the U.S. Fish and Wildlife Service National Wetland Inventory, U.S. Geological Survey (USGS) National Hydrography Dataset, USGS National Land Cover Database, USGS topographic quadrangles, U.S. Department of Agriculture (USDA) Digital Elevation Models, USDA-Natural Resources Conservation Service Web Soil Survey, Federal Emergency Management Agency National Flood Hazard Layer, and publicly available recent aerial images.

On January 24 and February 11, 2022, HDR environmental scientists Lyranda Thiem, Tennessee Qualified Hydrologic Professional In-Training (TN-QHP-IT), Caroline Ryciuk, and Sarah Weyler conducted field delineations of the Project Area for waters of the U.S., as defined under Section 404 of the Clean Water Act. Waters of the U.S. were delineated according to the methodology and guidance described in the USACE 1987 Wetland Delineation Manual, the 2008 Rapanos Rule, and the 2012 USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0). Streams were classified utilizing the methodology and guidance provided in Regulatory Guidance Letter 05-05 and the 2011 Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control *Guidance for Making Hydrologic Determinations* (Version 1.4). Waters of the U.S were mapped using a Trimble® Geo7X GPS unit capable of sub-meter accuracy. GPS points were post-processed utilizing Trimble® GPS Pathfinder Office Software.

The results of the desktop review and field survey are provided in this technical memorandum.

1.0 Project Area Description and Recent Weather Conditions

The TL Study Area consists of maintained TVA ROW. Dominant species within the ROW include grass species (*Poaceae spp.*), foxtail (*Setaria viridis*), soft rush (*Juncus effusus*), bushy bluestem (*Andropogon glomeratus*), field garlic (*Allium oleraceum*), velvet panic grass (*Dichanthelium scoparium*), tall goldenrod (*Solidago altissima*), black raspberry (*Rubus spp.*), and carex species (*Carex spp.*).

The TL Study Area is situated within Tims Ford Lake - Elk River watershed (Hydrologic Unit Code [HUC]-10 0603000304; Appendix A, Figure 3) and across three HUC-12 subbasins, consisting of Elk River watershed (HUC-12 060300030405), Rock Creek watershed (HUC-12 060300030402), and Spring Creek watershed (HUC-12 060300030401). On-site surface waters in the western portion drain to Turkey Creek, in the central portion drain to South Fork Blue Creek, and in the eastern portion drain to Spring Creek. These creeks generally flow to Tims Ford Lake/Elk River.

The USACE Antecedent Precipitation Tool (Appendix C) indicates the field delineation was conducted during normal weather conditions (Appendix C).

2.0 Soils Summary

The transmission line study area contains 17 soil types, according to the USDA-Natural Resources Conservation Service Web Soil Survey (Appendix E). The majority of the mapped soils are composed of Dickson silt loam (33.8 percent of the study area), Lawrence silt loam (22.6 percent of the study area), Baxter cherty silty clay loam (20.4 percent of the study area) and Mountview silt loam (5.1 percent of the study area), with other types of soil composing less than five percent of the study area each. Dickson silt loam is classified as being a hydric soil. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion.

Baxter cherty silt loam (undulating phase), Dickson silt loam, Greendale cherty silt loam, Greendale silt loam, and Lawrence silt loam are classified as prime farmland soils.

3.0 Jurisdictional Delineation

During the January and February 2022 survey, HDR delineated potentially jurisdictional wetlands according to the methodology and guidance described in the 1987 Corps of Engineers Wetlands Delineation Manual and the 2012 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0). Based on the TVA-developed modification of the 2001 U.S. Environmental Protection Agency Ohio Rapid Assessment Method for Wetlands specific to the TVA region, called the TVA Rapid Assessment Method or TVARAM, wetlands within the transmission line study area were evaluated by their functions and classified into three categories based on their TVARAM score: low quality (Score 0 to 29), moderate quality (Score 30 to 59), and high quality (Score 60 to 100). Streams were classified utilizing the methodology and guidance provided in Regulatory Guidance Letter 05-05 and the Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control Guidance for Making Hydrologic Determinations

(Version 1.4) (TDEC 2011). Potential jurisdictional wetlands and streams were flagged in the field and mapped using a Trimble® Geo7x GPS unit capable of sub-meter accuracy. GPS points were post-processed utilizing Trimble® GPS Pathfinder Office software. Representative photographs can be found in Appendix D.

4.0 Results

JURISDICTIONAL WATERS OF THE U.S.

The results of the on-site field investigation conducted by HDR indicate there are five jurisdictional streams, all perennial totaling 189 linear feet, and two jurisdictional wetlands, totaling 2.57 acres, within the TL Study Area (Appendix A, Figure 7). The on-site surface waters drain Tims Ford Lake - Elk River HUC-10 0603000304. A summary of on-site jurisdictional waters is provided in Table 1.

NON-JURISDICTIONAL FEATURES

The on-site investigation also delineated three non-jurisdictional ephemeral streams (wet weather conveyances), totaling 444 linear feet within the TL Study Area (Appendix A, Figure 7).

Table 1. Summary of on-site jurisdictional waters of the U.S.

Feature Name	Latitude/Longitude (decimal degrees)	Type of Aquatic Resource	Cowardin Classification[1]	Figure No.	Photo No.	Data Point (DP) No.		Estimated Amount of Aquatic Resource in Review Area
						Wet	Up	
Jurisdictional Streams								
Stream 1	35.330644; -86.206408	non section 10 -- wetland	R5UB3	5-5	14,15	N/A		Length: 46 ft. Width: 2-4 ft. Area: 0.004 ac.
Stream 2	35.331623; -86.177987	non section 10 -- wetland	R5UB3	5-5	12,13	N/A		Length: 38 ft. Width: 4-6 ft. Area: 0.005 ac.
Stream 3	35.332626 -86.176657	non section 10 -- wetland	R5UB1	5-6	17,18	N/A		Length: 58 ft. Width: 3-4 ft. Area: 0.005 ac.
Stream 4	35.333503 -86.139207	non section 10 -- wetland	R5UB1	5-6	19,20	N/A		Length: 29 ft. Width: 8-10 ft. Area: 0.007 ac.
Stream 5	35.333378 -86.136935	non section 10 -- wetland	R5UB3	5-8	22,23	N/A		Length: 18 ft. Width: 4-6 ft. Area: 0.002 ac.
							Jurisdictional Streams Total:	**Length: 189 ft.**
Jurisdictional Wetlands								
Wetland 1	35.331975; -86.226181	non section 10 -- wetland	PEM	5-2	1	DP3-W1	DP2-UP2	2.55 Ac.
Wetland 2	35.332275; -86.122608	non section 10 -- wetland	PEM	5-8	10	DP11 -W2	DP10 -UP9	0.02 Ac.

Feature Name	Latitude/Longitude (decimal degrees)	Type of Aquatic Resource	Cowardin Classification[1]	Figure No.	Photo No.	Data Point (DP) No.		Estimated Amount of Aquatic Resource in Review Area
						Wet	Up	
							Wetland Waters Total:	**Area: 2.57**
							Jurisdictional Waters of the U.S. Total:	**Length: 189 ft.** **Area: 2.57 ac.**

Table 2. Summary of on-site non-jurisdictional features.

Feature Name	Latitude/ Longitude (decimal degrees)	Type of Aquatic Resource	Cowardin Classification[1]	Figure No.	Photo No.	Estimated Amount of Aquatic Resource in Review Area
Ephemeral 1	35.334986/ -86.274215	Ephemeral	NA	5-1	24, 25	Length: 82 ft. Width: 1 ft. Area: 0.002 ac.
Ephemeral 2	35.330264/ -86.203532	Ephemeral	NA	5-3	26	Length: 118 ft. Width: 2-4 ft. Area: 0.01 ac.
Ephemeral 3	35.333121/ -86.132904	Ephemeral	NA	5-3	27,28	Length: 91 ft. Width: 2-4 ft. Area: 0.008 ac.
Ephemeral 4	35.332199/ -86.176810	Ephemeral	NA	5-5	16	Length: 136 ft. Width: 4 ft. Area: 0.005 ac.
Ephemeral 5	35.333132/ -86.132907	Ephemeral	NA	5-7	21	Length: 17 ft. Width: 2-4 ft. Area: 0.002 ac.
			Non-Jurisdictional Features Area Total:			**Length: 444 ft.**

5.0 Impact Assessment

TL upgrade activities that would be necessary to interconnect the solar PV facility to TVA's existing electrical transmission network could result in stream and wetland impacts. The installation of the OPGW within the TL upgrade locations would not require pole replacements along the existing ROW. TVA would install five new pole structures adjacent to the Project substation, on the Project Site. These pole installations would avoid delineated wetlands and streams. Typically, fiber installation requires vehicular access along the ROW to each TL structure in order to support aerial work. Access across wetlands located in the ROW would be conducted in accordance with wetland BMPs to minimize soil compaction and ensure only temporary impacts result. This includes use of low ground pressure equipment, wetland mats, and dry season work scheduling. Permanent stream crossings that cannot be avoided would be designed to not impede runoff patterns and the natural movement of aquatic fauna and would comply with appropriate USACE permit requirements. Temporary stream crossings and other construction and maintenance activities associated with the TL upgrades would comply with

appropriate state permit requirements and TVA requirements as described in TVA's BMP manual.

TVA would adhere to all wetland mandates. Applicable Clean Water Act Section 404 and 401 permits would be obtained for impacts that cannot be avoided, and application of the terms and conditions of these permits would minimize these impacts. The permits may also require compensatory mitigation.

Attachments:

Appendix A: Figures
Appendix B: Wetland and Stream Data Forms
Appendix C: Normal Weather Conditions
Appendix D: Photographs
Appendix E: Soils Report

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP1-UP1

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.334751 Long: -86.275014 Datum: NAD83

Soil Map Unit Name: Mountview silt loam, 5 to 12 percent slopes NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a fallow field near a transmission line.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP1-UP1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	60	Yes	FACU
2. *Allium oleraceum*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover:	35	20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	10	x 5 =	50
Column Totals:	70 (A)		290 (B

Prevalence Index = B/A = 4.14

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP1-UP1

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
0-3	10YR 4/2	100					Loamy/Clayey	
3-20	10YR 4/3	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP2-UP2

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331645 Long: -86.222485 Datum: NAD83

Soil Map Unit Name: Lawrence silt loam NWI classification: None

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

Are Vegetation X , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP2-UP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	60	Yes	FACU
2. *Allium oleraceum*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover:	35	20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	10	x 5 =	50
Column Totals:	70 (A)		290 (B

Prevalence Index = B/A = 4.14

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP2-UP2

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
0-3	10YR 4/2	100					Loamy/Clayey	
3-20	10YR 4/3	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP4-UP3

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331493 Long: -86.205758 Datum: NAD83

Soil Map Unit Name: Baxter cherty silty clay loam, severely eroded hilly phase NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP4-UP3

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	10	No	FACU
2. *Zea mays*	90	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	90	x 5 =	450
Column Totals:	100 (A)		490 (B

Prevalence Index = B/A = 4.90

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP4-UP3

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
0-20	10YR 4/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP5-UP4

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331255 Long: -86.184710 Datum: NAD83

Soil Map Unit Name: Baxter cherty silt loam, eroded rolling phase NWI classification: None

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

Are Vegetation X , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP5-UP4

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	20	Yes	FACU
2. *Zea mays*	50	Yes	UPL
3. *Lamium purpureum*	5	No	UPL
4. *Allium oleraceum*	5	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover: 16	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	60	x 5 =	300
Column Totals:	80 (A)		380 (B

Prevalence Index = B/A = 4.75

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP5-UP4

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
0-20	10YR 4/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SR Tullahoma City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP6-UP5

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.332173 Long: -86.178066 Datum: NAD83

Soil Map Unit Name: Dickson silt loam, 2 to 5 percent slopes, eroded NWI classification: None

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

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This upland datapoint is in the middle of a agricultural field near a transmission line pole location.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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:
Primary hydrology indicators are not present.

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

Sampling Point: DP6-UP5

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceace sp.*	70	Yes	FACU
2. *Setaria viridis*	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	=Total Cover	
50% of total cover:	40	20% of total cover:	16

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	80 (A)		320 (B)

Prevalence Index = B/A = 4.00

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydric Vegetation is not Present
*Species indicator status range OBL-UPL. Assigned FACU status for wetland/upland determination.

SOIL

Sampling Point: DP6-UP5

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
0-12	10YR 4/3	100					Loamy/Clayey	
12-20	10YR 4/3	95	7.5YR 5/8	5	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present. .

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP5-UP4

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331255 Long: -86.184710 Datum: NAD83

Soil Map Unit Name: Baxter cherty silt loam, eroded rolling phase NWI classification: None

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

Are Vegetation X , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP5-UP4

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	20	Yes	FACU
2. *Zea mays*	50	Yes	UPL
3. *Lamium purpureum*	5	No	UPL
4. *Allium oleraceum*	5	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover: 16	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	60	x 5 =	300
Column Totals:	80 (A)		380 (B

Prevalence Index = B/A = 4.75

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP5-UP4

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
0-20	10YR 4/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP4-UP3

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331493 Long: -86.205758 Datum: NAD83

Soil Map Unit Name: Baxter cherty silty clay loam, severely eroded hilly phase NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP4-UP3

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	10	No	FACU
2. *Zea mays*	90	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	90	x 5 =	450
Column Totals:	100 (A)		490 (B

Prevalence Index = B/A = 4.90

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP4-UP3

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
0-20	10YR 4/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP2-UP2

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331645 Long: -86.222485 Datum: NAD83

Soil Map Unit Name: Lawrence silt loam NWI classification: None

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

Are Vegetation X , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a corn 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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP2-UP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	60	Yes	FACU
2. *Allium oleraceum*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover:	35	20% of total cover:	14

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	10	x 5 =	50
Column Totals:	70 (A)		290 (B

Prevalence Index = B/A = 4.14

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP2-UP2

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
0-3	10YR 4/2	100					Loamy/Clayey	
3-20	10YR 4/3	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP7-UP6

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.334026 Long: -86.144335 Datum: NAD83

Soil Map Unit Name: Dickson silt loam, 2 to 5 percent slopes NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a fallow field near a transmission line.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP7-UP6

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	30	Yes	FACU
2. *Andropogon virginicus*	30	Yes	FACU
3. *Rubus aboriginum*	15	No	UPL
4. Solidago altissima	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	15	x 5 =	75
Column Totals:	90 (A)		375 (B

Prevalence Index = B/A = 4.17

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP7-UP6

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
0-3	10YR 3/3	100					Loamy/Clayey	
3-20	10YR 5/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 2/11/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP8-UP7

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.333337 Long: -86.136387 Datum: NAD83

Soil Map Unit Name: Dickson silt loam, 2 to 5 percent slopes NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a fallow field near a transmission line.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP8-UP7

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	30	Yes	FACU
2. *Andropogon virginicus*	30	Yes	FACU
3. *Rubus aboriginum*	15	No	UPL
4. Solidago altissima	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	15	x 5 =	75
Column Totals:	90 (A)		375 (B

Prevalence Index = B/A = 4.17

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP8-UP7

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
0-3	10YR 3/3	100					Loamy/Clayey	
3-20	10YR 5/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 2/11/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP9-UP8

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.333102 Long: -86.132945 Datum: NAD83

Soil Map Unit Name: Baxter cherty silt loam, eroded hilly phase NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a fallow field near a transmission line.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP9-UP8

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	5	Yes	FACU
2. *Prunus serotina*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover: 3	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Poaceae sp.**	5	No	FACU
2. *Andropogon virginicus*	30	Yes	FACU
3. *Rubus aboriginum*	35	Yes	UPL
4. Solidago altissima	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover: 17	

Woody Vine Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	65	x 4 =	260
UPL species	35	x 5 =	175
Column Totals:	100 (A)		435 (B

Prevalence Index = B/A = 4.35

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP9-UP8

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
0-3	10YR 3/3	100					Loamy/Clayey	
3-20	10YR 5/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 2/11/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP10-UPS

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.332248 Long: -86.122679 Datum: NAD83

Soil Map Unit Name: Baxter cherty silt loam, eroded hilly phase NWI classification: None

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

Are Vegetation X, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Upland data point was take in a fallow field near a transmission line.

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)
- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

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 Hydrology is not present.

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

Sampling Point: DP10-UP9

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Poaceae sp.**	30	Yes	FACU
2. *Andropogon virginicus*	30	Yes	FACU
3. *Rubus aboriginum*	15	No	UPL
4. Solidago altissima	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 0.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	15	x 5 =	75
Column Totals:	90 (A)		375 (B

Prevalence Index = B/A = 4.17

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 supportin data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hyrdric Vegetation is not present.
* Species indicator status ranges from UPL-OBL. Given FACU status for this survey due to being in an upland area.

SOIL

Sampling Point: DP10-UP9

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
0-3	10YR 3/3	100					Loamy/Clayey	
3-20	10YR 5/4	100					Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are not present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 2/11/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP 40

Investigator(s): Lyranda Thiem and Caroline Ryciuk Section, Township, Range: _____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.332251 Long: -86.122577 Datum: NAD83

Soil Map Unit Name: Baxter cherty silt loam, rolling phase NWI classification: PEM

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This is a PEM wetland located around a perennial stream at the bottome of two hillsides.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP 40

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	30	Yes	FACW
2. *Juncus tenuis*	10	Yes	FACW
3. *Setaria sp.*	10	Yes	FAC
4. *Rubus aboriginum*	10	Yes	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	=Total Cover	
50% of total cover:	30	20% of total cover:	12

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	60 (A)		160 (B

Prevalence Index = B/A = 2.67

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supportin data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: DP 40

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	2.5Y 4/4	100					Loamy/Clayey	
2-20	2.5Y 5/2	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SRC Moore City/County: Moore Sampling Date: 1/25/2022

Applicant/Owner: Silicon Ranch Corporation State: TN Sampling Point: DP3-W1

Investigator(s): Lyranda Thiem and Sarah Weyler Section, Township, Range: _____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N, MLRA 122 Lat: 35.331732 Long: -86.224479 Datum: NAD83

Soil Map Unit Name: Lawrence silt loam NWI classification: PEM

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

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes 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:
This wetland is part of a large wetland complex. This wetland is representative of Wetland 1

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X 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)
- X 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Wetland hydrology is present.

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

Sampling Point: DP3-W1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Juncus tenuis*	10	No	FAC
2. *Sphagnum sp.*	10	No	FACW
3. *Andropogon glomeratus*	20	Yes	FACW
4. *Poaceae sp.* *	10	No	FACW
5. *Carex sp.*	40	Yes	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		190 (B

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supportin data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must b present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c more in diameter at breast height (DBH), regardless o height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

*Species indicator status range OBL-UPL. Assigned FACW status for wetland/upland determination.

SOIL

Sampling Point: DP3-W1

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
0-3	10YR 4/2	100					Loamy/Clayey	
3-20	2.5Y 5/2	90	10YR 5/8	10	C	M	Loamy/Clayey	

[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) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:
Hydric soil indicators are present.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 1/25/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: S1	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.330644; -86.206408
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and TL ROW	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NA	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	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) = 20.5

Justification / Notes :

This is a perennial stream that flows at the eastern edge of the subject property.

Bank Height: 6 inches to 2 feet, Bank Width: 4 feet, and Water Depth: 6 inches to 1 foot Substrate consisted of gravel and silt

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =10)	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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 20.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Some gravel was sorting from the cobble. 2 isopods, 2 scuds, and one damselfly were observed within this stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 1/25/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: S2	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.331623; -86.177987
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and TL ROW	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NA	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	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) = 20.5

Justification / Notes :

This is a perennial stream that flows at the eastern edge of the subject property.

Bank Height: 6 inches to 2 feet, Bank Width: 4 feet, and Water Depth: 6 inches to 1 foot Substrate consisted of gravel and silt

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =10)	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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 20.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Some gravel was sorting from the cobble. 2 isopods, 2 scuds, and one damselfly were observed within this stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 2/11/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: S3	
Site Location: Perennial stream located at the bottom of two hills	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.332626 -86.176657
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and TL ROW	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NA	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)		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) = 26.5

Justification / Notes :

This is a perennial stream that flows at the bottom of two hills. A road crossing runs through it.

Bank Height: 6 inches to 2 feet, Bank Width: 4-5 feet, and Water Depth: 1-2 feet. Substrate consisted of cobble, gravel and silt

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 13.5)	**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 = 6)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 26.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Some gravel was sorting from the cobble. 3 isopods, 10 scuds, and one damselfly were observed within this stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 2/11/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: S4 (Spring Creek)	
Site Location: Perennial stream located at the bottom of two hills	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.333503 -86.139207
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and TL ROW	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NA	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)		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) = 29

Justification / Notes :

This is a perennial stream that flows at the bottom of two hills. A road crossing runs through it.

Bank Height: 2 feet to 4 feet, Bank Width: 10-15 feet, and Water Depth: 3-5 feet. Substrate consisted of cobble, gravel and silt

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =14.5)	**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 = 7)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 31.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Some gravel was sorting from the cobble. Two mayflies, 4 scuds, and one damselfly were observed within this stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 2/11/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: S5	
Site Location: Perennial stream located at the bottom of two hills	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.333378 -86.136935
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Sullivan
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and TL ROW	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	NA	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	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) = 29

Justification / Notes :

This is a perennial stream that flows at the bottom of two hills. A road crossing runs through it.

Bank Height: 6inches to 1 foot, Bank Width: 4-6 feet, and Water Depth: 1-2 feet. Substrate consisted of cobble, gravel and silt

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =11.5)	**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 = 10.5)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 29

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Some gravel was sorting from the cobble. One isopod, 4 scuds, and one damselfly were observed within this stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 1/25/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: WWC 1	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.334986/ -86.274215
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Mountview silt loam, 5 to 12 percent slopes	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and Agricultural Fields	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	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 = WWC

Secondary Indicator Score (if applicable) =

Justification / Notes :

This WWC flows within a fallow field.

Bank Width: 1 foot

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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 1/25/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: WWC 2	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.330264; -86.203532
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Mountview silt loam, 5 to 12 percent slopes	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and Agricultural Fields	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	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 = WWC

Secondary Indicator Score (if applicable) = 7.5

Justification / Notes :

This WWC flows at the bottom of two hills and has been altered by agricultural practices .

Bank Width: 2-4 feet and Bank Height: 2 ft

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**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 = 1.5)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 7.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 1/25/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: WWC 3 and WWC 4	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.333121 -86.132904
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Mountview silt loam, 5 to 12 percent slopes	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and Agricultural Fields	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	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 = WWC

Secondary Indicator Score (if applicable) = 4.5

Justification / Notes :

This WWC flows at the bottom of two hills and has been altered by agricultural practices .

Bank Width: 2-4 feet and Bank Height: 2 ft

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**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 = 1.5)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 4.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Spring Creek	Date/Time: 2/11/2022
Assessors/Affiliation: HDR INC/ Lyranda Thiem	Project ID : SR Tullahoma TL
Site Name/Description: WWC 5	
Site Location: Perennial stream located within an agricultural field	
HUC (12 digit): Middle Lick Creek watershed (HUC 060101080804)	Lat/Long: 35.333132/ -86.132907
Previous Rainfall (7-days) : In the previous 7 days it rained 1.5 inches	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : ESRL and AHPS	
Watershed Size :	County: Moore
Soil Type(s) / Geology : Mountview silt loam, 5 to 12 percent slopes	Source: USDA: Web Soil Survey
Surrounding Land Use : Forested and Agricultural Fields	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature 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 15th, under normal precipitation / groundwater conditions	NA	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 *Gambusia*)	✓	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 = WWC

Secondary Indicator Score (if applicable) = 7

Justification / Notes :

This WWC flows at the bottom of two hills.

Bank Width: 2-4 feet and Bank Height: 6 inches

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**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 = 3.5)	**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 channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the 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 bed [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 = 7

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality
TVARAM FIELD FORM

Site: SR Tullahoma Solar	**Rater(s):** L. Thiem and S. Weyler	**Date:** 1/25/2022

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

9	12
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 50 m (164 ft) or more around wetland perimeter (7)
- ☑ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) 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), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

13	25
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

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)

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other _____

14	39
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)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☑ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☑ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

39

Site: SR Tullahoma Solar	Rater(s): L. Thiem and S. Weyler	Date: 1/25/2022

39
subtotal previous page

3	42
max 10 pts.	subtotal

45
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [x] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	51
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [x] Emergent 2
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a 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 a 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 a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [x] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

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

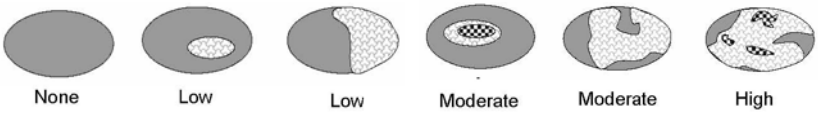
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

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

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

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in 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

51	**GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

W2-PEM

Site: SR Tullahoma Solar	Rater(s): L.Thiem and C. Ryciuk	Date: 2/11/2022

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☑ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

9	9
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 50 m (164 ft) or more around wetland perimeter (7)
- ☑ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) 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), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

18	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☑ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

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)

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☑ road bed/RR track
- ☐ dredging
- ☐ other _____

12	39
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)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☑ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

39

Site: SR Tullahoma Solar	Rater(s): L.Thiem and C. Ryciuk	Date: 2/11/2022

39
subtotal previous page

3 (max 10 pts.) | 42 (subtotal)

42
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

5 (max 20 pts.) | 47 (subtotal)

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [x] Emergent 2
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a 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 a 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 a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [x] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

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

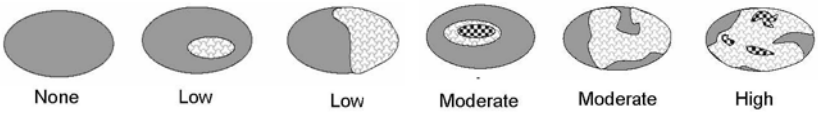
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

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

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

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in 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

47

GRAND TOTAL (max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1

2a Avg.= 0.00

2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

Non-JD W1

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	2
1pt	<0.4m (<15.7in)	
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 2.00

SR Tullahoma

Non-JD W1

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	x	other (specify) forested clear cut

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	1

3e Avg= 1.00

SR Tullahoma

Metric 3 Total 7.00

Non-JD W1

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	1

4a Avg.= 1.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	1

4b Avg.= 1.00

SR Tullahoma Non-JD W1

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting	X	Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 3

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	1
0pt NONE Wetland has no plan view interspersion	

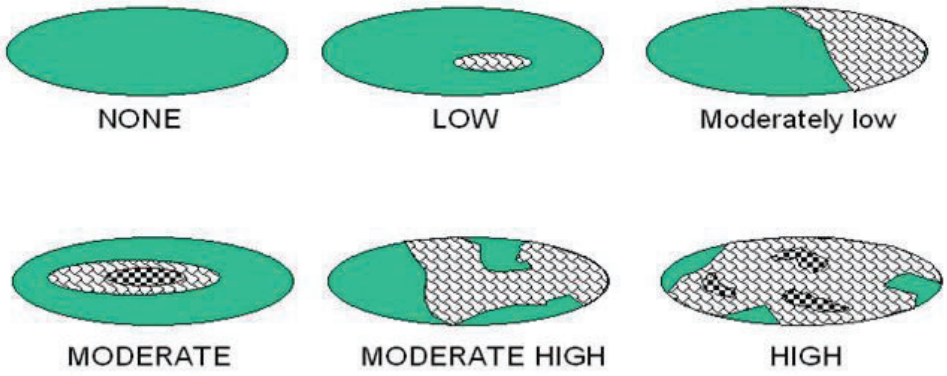


Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	1

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 4

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	7
	Metric 4: Habitat	3
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	4
	TOTAL SCORE	17

SR Tullahoma

Non-JD W1

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	3
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 0.00

2b Avg.= 3.00

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Metric 2 Total 3.00

Non-JD W2

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 2.00

SR Tullahoma

Non-JD W2

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	1

3e Avg= 1.00

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Metric 3 Total 9.00

Non-JD W2

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	1

4a Avg.= 1.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	1

4b Avg.= 1.00

SR Tullahoma Non-JD W2

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 3

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	1
0pt NONE Wetland has no plan view interspersion	

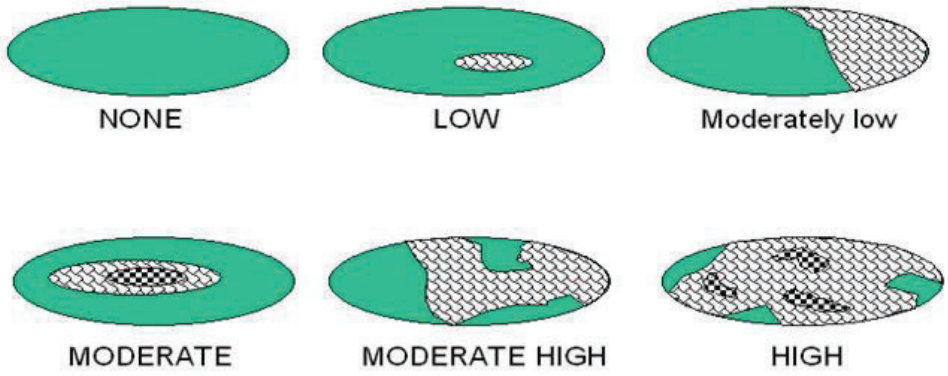

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 2

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	3
	Metric 3: Hydrology	9
	Metric 4: Habitat	3
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	2
	TOTAL SCORE	18

SR Tullahoma

Non-JD W2

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1

2a Avg.= 0.00

2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

Non-JD W3

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

Non-JD W3

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
3.00

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Metric 3 Total 9.00

Non-JD W3

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma Non-JD W3

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	5
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

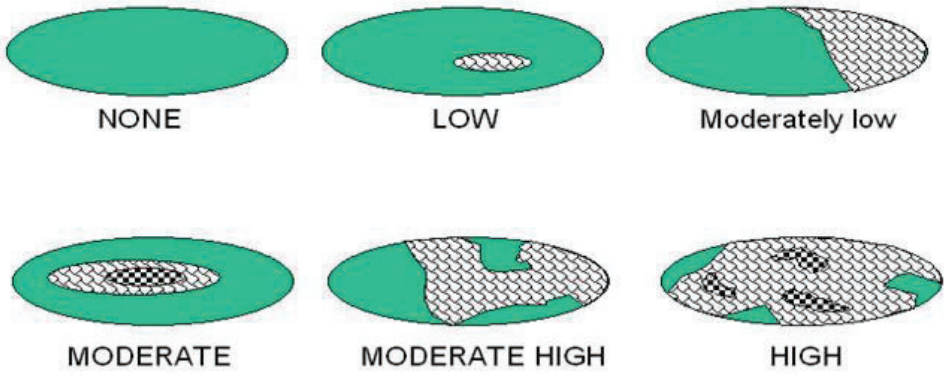

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 10

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	9
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	10
	TOTAL SCORE	30

SR Tullahoma

Non-JD W3

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1

2a Avg.= 0.00

2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

Non-JD W4

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

Non-JD W4

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
3.00

SR Tullahoma

Metric 3 Total 9.00

Non-JD W4

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma Non-JD W4

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	5
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

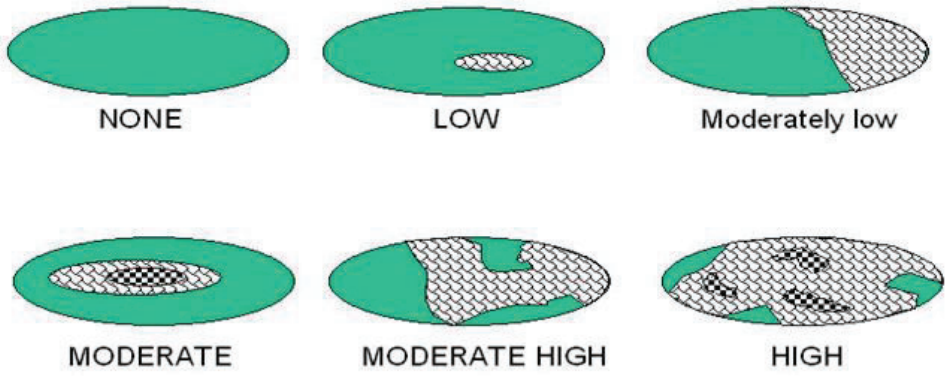

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 10

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	9
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	10
	TOTAL SCORE	29

SR Tullahoma

Non-JD W4

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
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3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	1
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	3
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 1.00

2b Avg.= 3.00

SR Tullahoma

Metric 2 Total 4.00

Non-JD W5

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

Non-JD W5

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
3.00

SR Tullahoma

Metric 3 Total 12.00

Non-JD W5

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma Non-JD W5

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

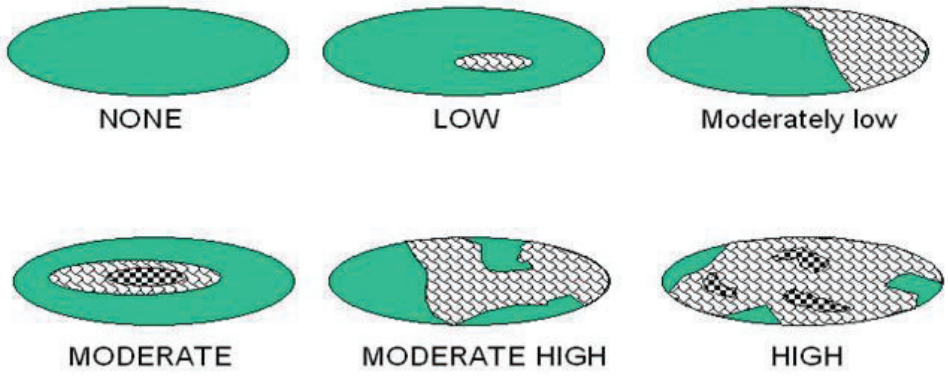

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 5

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	4
	Metric 3: Hydrology	12
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	5
	TOTAL SCORE	30

SR Tullahoma

Non-JD W5

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.		
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.		
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0	2a Avg.= 0.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.		
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.		
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1	2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

Non-JD W6

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

Non-JD W6

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	1

3e Avg= 1.00

SR Tullahoma

Metric 3 Total 8.00

Non-JD W6

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	1

4a Avg.= 1.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	1

4b Avg.= 1.00

SR Tullahoma Non-JD W6

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 3

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	0

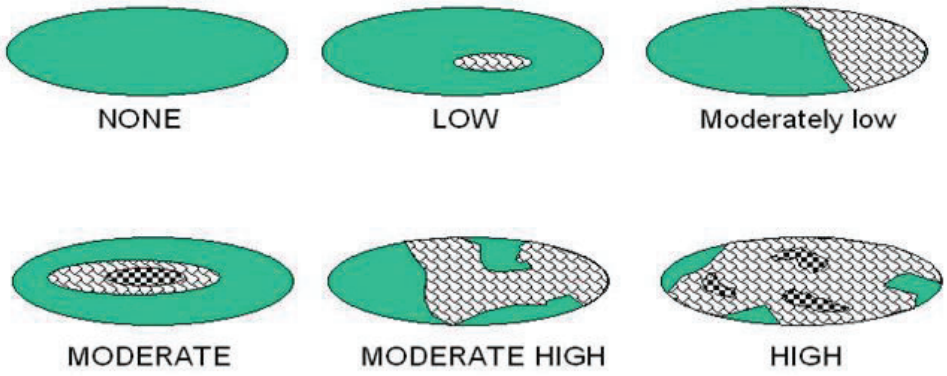

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 3

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	8
	Metric 4: Habitat	3
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	3
	TOTAL SCORE	16

SR Tullahoma

Non-JD W6

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

Non-JD W7

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	2
1pt	<0.4m (<15.7in)	
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 2.00

SR Tullahoma

Non-JD W7

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

SR Tullahoma

Metric 3 Total 18.00

Non-JD W7

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	5
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 5.00

SR Tullahoma Non-JD W7

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 18

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
10	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 20

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

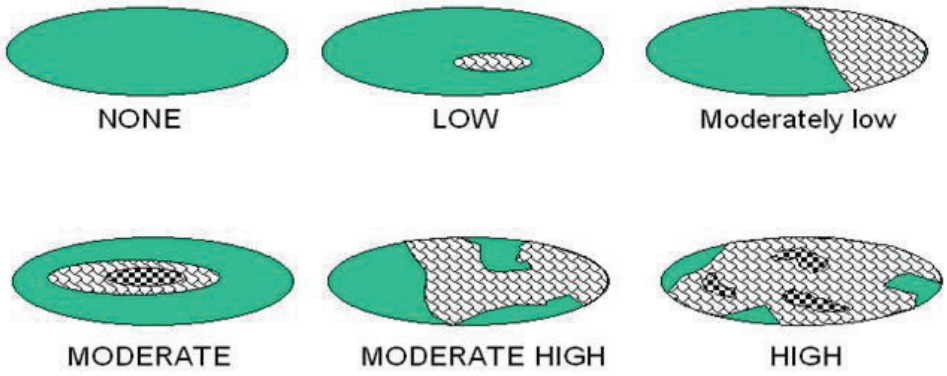

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	2
Coarse woody debris >15cm (6in) in diameter	1
Standing dead trees >25cm (10in) diameter at breast height	2
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	1

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 14

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	18
	Metric 4: Habitat	18
	Metric 5: Special Wetland Communities	20
	Metric 6: Plant communities, interspersion, microtopography	14
	TOTAL SCORE	83

SR Tullahoma

Non-JD W7

Rank = Exceptional

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.		
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.		
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0	2a Avg.= 0.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.		
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.		
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1	2b Avg.= 1.00

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Metric 2 Total 1.00

Non-JD W8

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

Non-JD W8

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 12.00

Non-JD W8

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma Non-JD W8

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 9

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	3
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

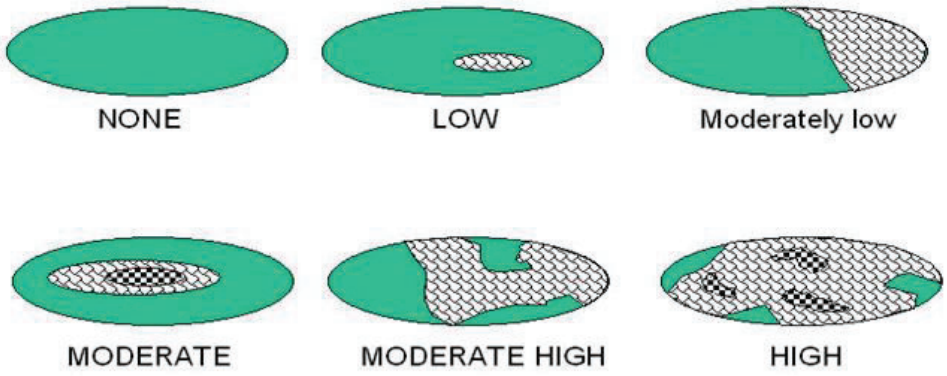

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 8

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	12
	Metric 4: Habitat	9
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	8
	TOTAL SCORE	32

SR Tullahoma

Non-JD W8

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
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10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 7.00

SR Tullahoma

Metric 2 Total 14.00

Non-JD W9

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

Non-JD W9

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

SR Tullahoma

Metric 3 Total 22.00

Non-JD W9

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma Non-JD W9

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 19

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

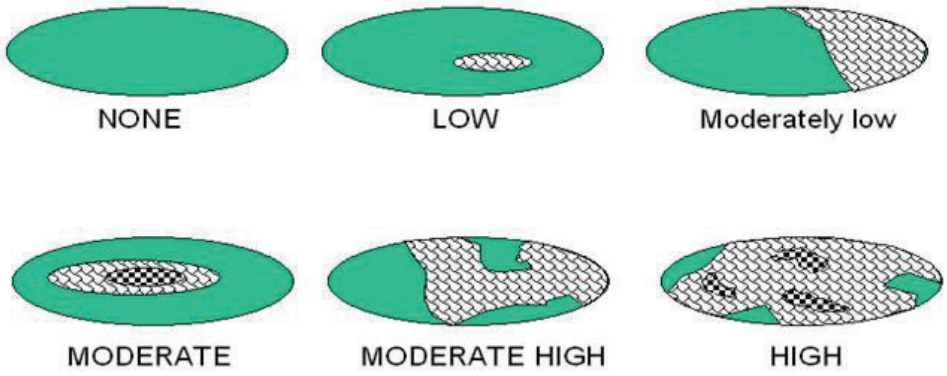

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 8

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	14
	Metric 3: Hydrology	22
	Metric 4: Habitat	19
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	8
	TOTAL SCORE	64

SR Tullahoma

Non-JD W9

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.	7	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.		
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.		2a Avg.= 7.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.		
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.		2b Avg.= 7.00

SR Tullahoma

Metric 2 Total 14.00

Non-JD W10

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

Non-JD W10

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

SR Tullahoma

Metric 3 Total 22.00

Non-JD W10

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma Non-JD W10

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 19

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

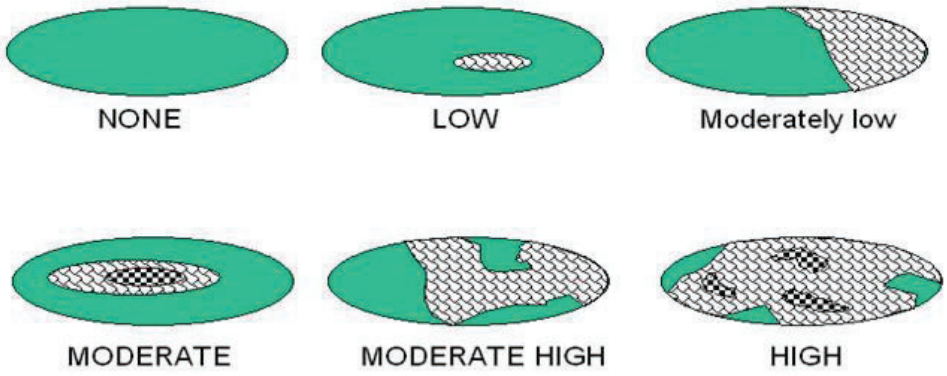

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 8

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	14
	Metric 3: Hydrology	22
	Metric 4: Habitat	19
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	8
	TOTAL SCORE	64

SR Tullahoma

Non-JD W10

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 7.00

SR Tullahoma

Metric 2 Total 14.00

Non-JD W11

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

Non-JD W11

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

SR Tullahoma

Metric 3 Total 22.00

Non-JD W11

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma Non-JD W11

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 19

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

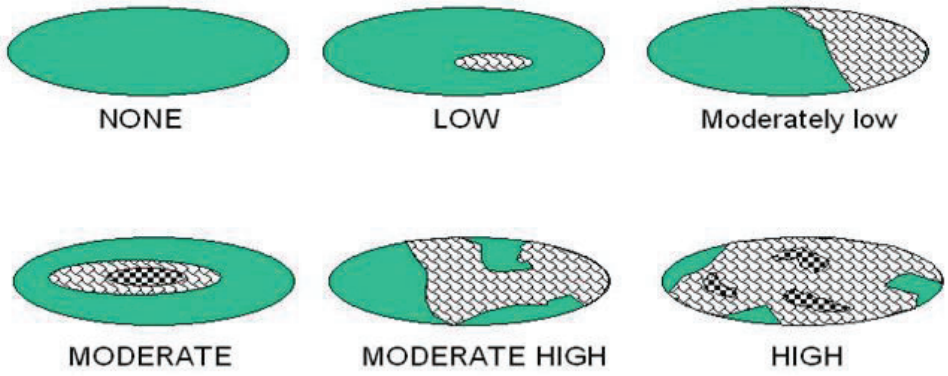

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 8

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	14
	Metric 3: Hydrology	22
	Metric 4: Habitat	19
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	8
	TOTAL SCORE	64

SR Tullahoma

Non-JD W11

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating
Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.		
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.		2a Avg.= 4.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.		
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.		2b Avg.= 5.00

SR Tullahoma

TL Area

W1-PEM (TL)

Metric 2 Total 9.00

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

TL Area

W1-PEM (TL)

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 13.00

TL Area

W1-PEM (TL)

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	5
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 5.00

SR Tullahoma TL Area W1-PEM (TL)

Quantitative Rating

Tennessee Rapid Assessment Method

SR Tullahoma

W1-PEM (TL)

TL Area

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

X	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 14

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

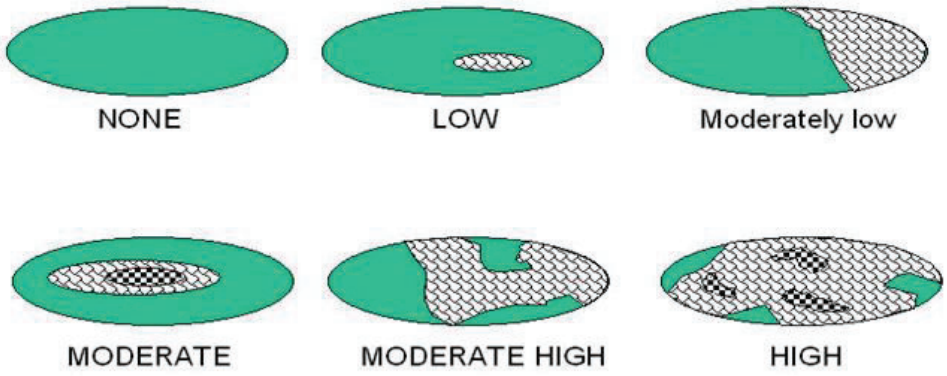

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	1

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 6

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	9
	Metric 3: Hydrology	13
	Metric 4: Habitat	14
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	6
	TOTAL SCORE	44

SR Tullahoma

TL Area

W1-PEM (TL)

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating
Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 5.00

SR Tullahoma

TL Area

W2-PEM (TL)

Metric 2 Total 9.00

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	1
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

TL Area

W2-PEM (TL)

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 18.00

TL Area

W2-PEM (TL)

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma TL Area W2-PEM (TL)

Quantitative Rating
Tennessee Rapid Assessment Method

SR Tullahoma

W2-PEM (TL)

TL Area

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 12

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

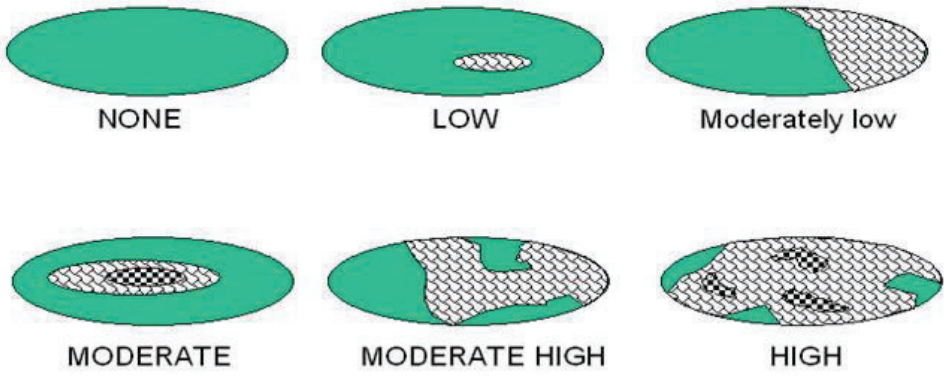

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	1

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 6

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	9
	Metric 3: Hydrology	18
	Metric 4: Habitat	12
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	6
	TOTAL SCORE	56

SR Tullahoma

TL Area

W2-PEM (TL)

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	3
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 3

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

W1

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	2
1pt	<0.4m (<15.7in)	
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W1

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	X	other (specify) Clear cut

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg= 3.00

SR Tullahoma

Metric 3 Total 11.00

W1

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma W1

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 11

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	2
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

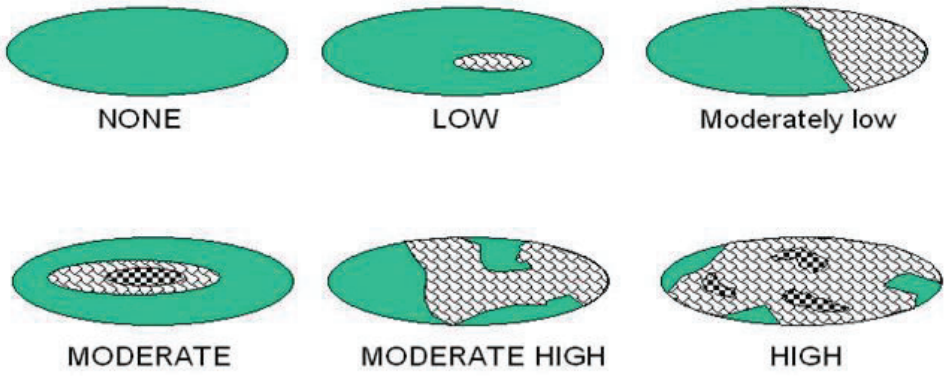

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	
Coarse woody debris >15cm (6in) in diameter	
Standing dead trees >25cm (10in) diameter at breast height	
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 6

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	3
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	11
	Metric 4: Habitat	11
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	6
	TOTAL SCORE	53

SR Tullahoma

W1

Rank = moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 0.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 5.00

W2

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W2

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 16.00

W2

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	4
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 4.00

SR Tullahoma W2

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 17

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	1
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

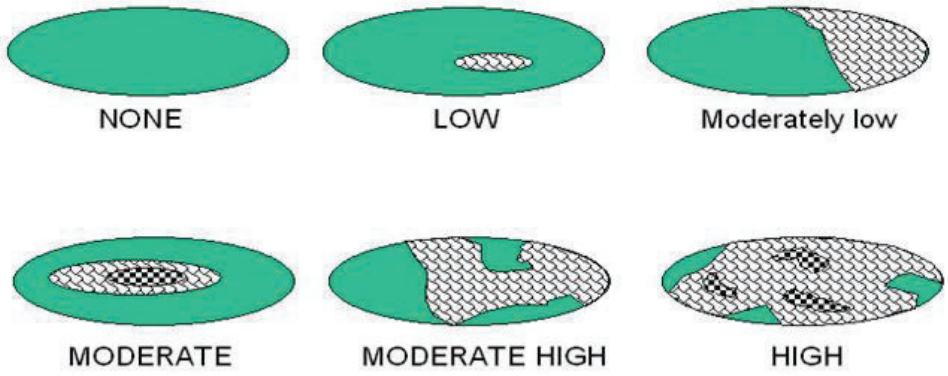

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	5
	Metric 3: Hydrology	16
	Metric 4: Habitat	17
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	46

SR Tullahoma

W2

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	3
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 3

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 7.00

SR Tullahoma

Metric 2 Total 14.00

W3

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W3

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

SR Tullahoma

Metric 3 Total 22.00

W3

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	4
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 4.00

SR Tullahoma W3

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 17

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

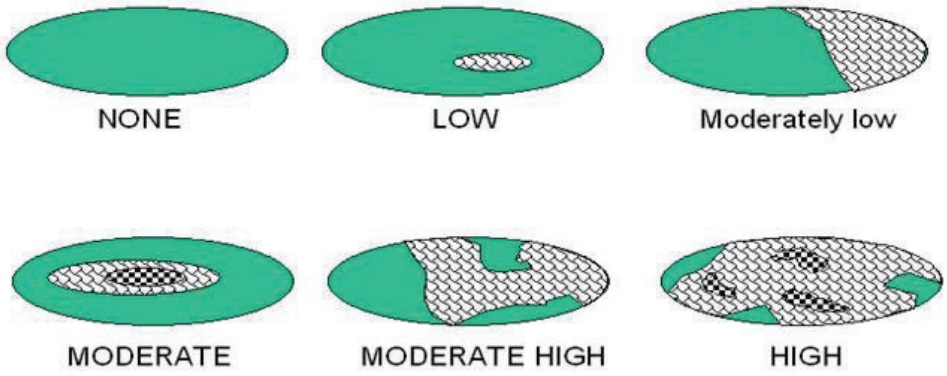

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 6

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	3
	Metric 2: Buffers and surrounding land use	14
	Metric 3: Hydrology	22
	Metric 4: Habitat	17
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	6
	TOTAL SCORE	72

SR Tullahoma

W3

Rank = moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	6
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
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3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 6

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

W4

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a part of, other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W4

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 17.00

W4

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma W4

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 15

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	2
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

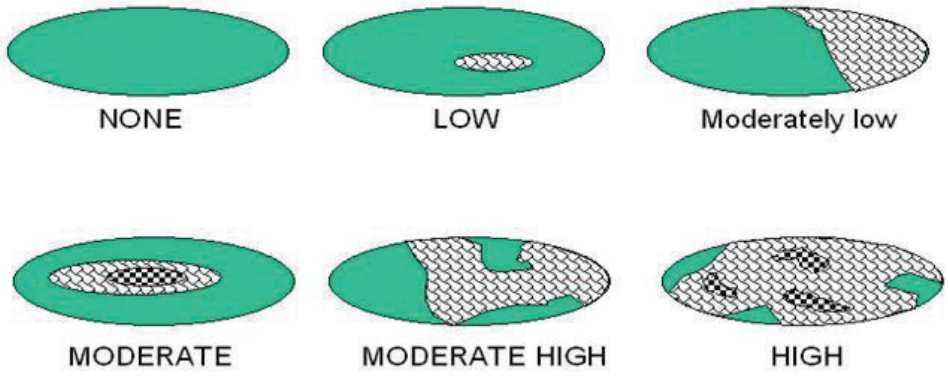

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 11

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	6
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	17
	Metric 4: Habitat	15
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	11
	TOTAL SCORE	71

SR Tullahoma

W4

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	1
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	3
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 2.50

2b Avg.= 3.00

SR Tullahoma

Metric 2 Total 5.50

W5

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W5

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg= 3.00

SR Tullahoma

Metric 3 Total 12.00

W5

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma W5

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

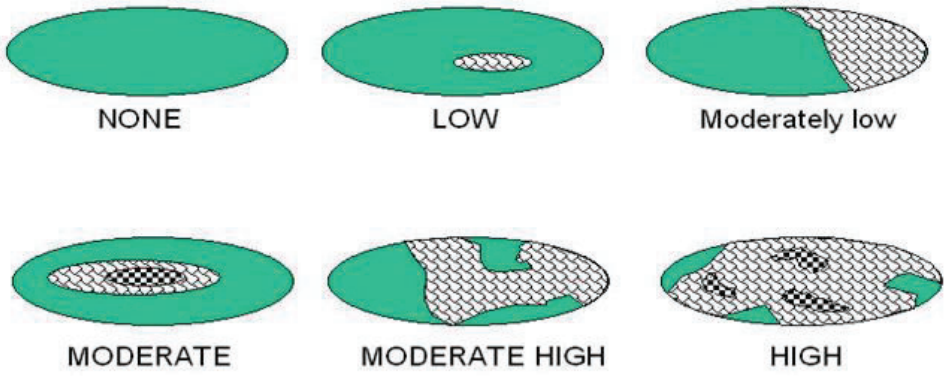

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 6

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	5.5
	Metric 3: Hydrology	12
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	6
	TOTAL SCORE	34

SR Tullahoma

W5

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	3
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 3

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 5.00

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Metric 2 Total 9.00

W6

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a part of, other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W6

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	X	other (specify) TVA line nearby

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg= 3.00

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Metric 3 Total 11.00

W6

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma W6

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	3
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	2
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	1
0pt NONE Wetland has no plan view interspersion	

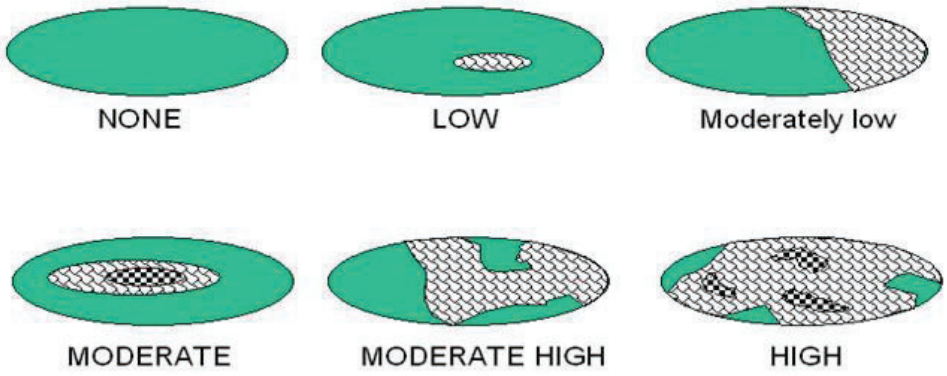

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 9

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	3
	Metric 2: Buffers and surrounding land use	9
	Metric 3: Hydrology	11
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	9
	TOTAL SCORE	40

SR Tullahoma

W6

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	4
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 4

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1

2a Avg.= 0.00

2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

W7

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

W7

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland	X	filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	X	other (specify) Clear cutting

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	1

3e Avg= 1.00

SR Tullahoma

Metric 3 Total 11.00

W7

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	1

4a Avg.= 1.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	2
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 2.00

SR Tullahoma W7

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 4

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	3
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	5
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

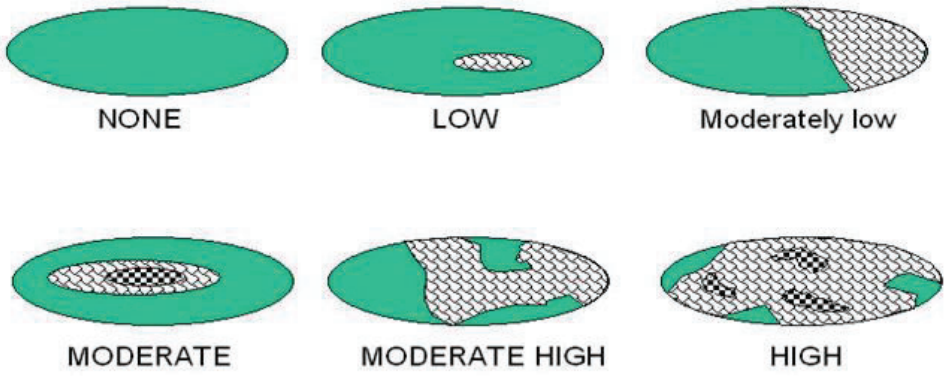

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 9

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	4
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	11
	Metric 4: Habitat	4
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	9
	TOTAL SCORE	29

SR Tullahoma

W7

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
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3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.		
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.		
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0	2a Avg.= 0.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.		
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.		
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	1	2b Avg.= 1.00

SR Tullahoma

Metric 2 Total 1.00

W8

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W8

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland	X	road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	X	other (specify) Logging

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	1

3e Avg= 1.00

SR Tullahoma

Metric 3 Total 8.00

W8

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	1

4a Avg.= 1.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	2
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 2.00

SR Tullahoma W8

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 4

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	1
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

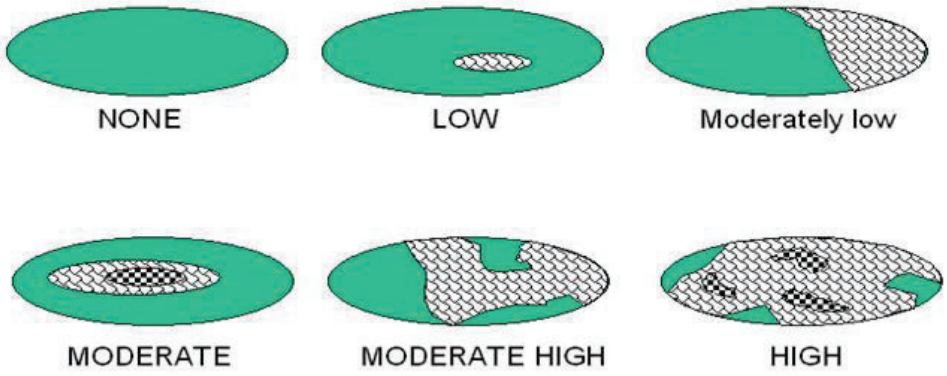

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 9

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	1
	Metric 3: Hydrology	8
	Metric 4: Habitat	4
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	9
	TOTAL SCORE	24

SR Tullahoma

W8

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	6
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 6

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 7.00

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Metric 2 Total 11.00

W9

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	1
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 2.00

SR Tullahoma

W9

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

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Metric 3 Total 24.00

W9

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma W9

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	1

4c Avg. = 1.00

Metric 4 Total 11

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

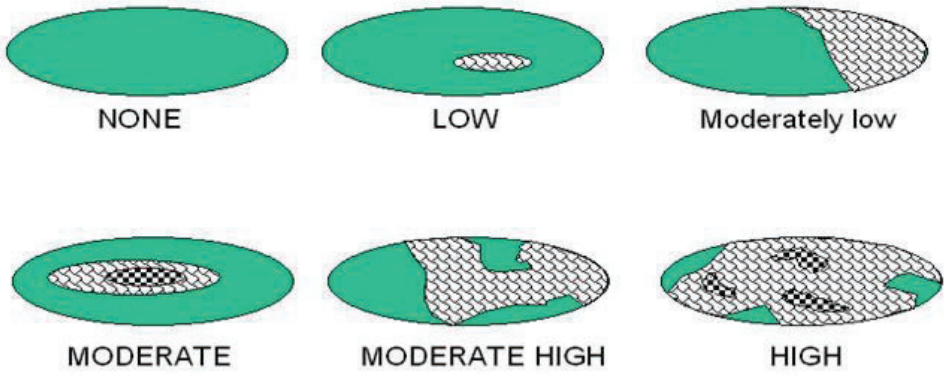

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 10

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	6
	Metric 2: Buffers and surrounding land use	11
	Metric 3: Hydrology	24
	Metric 4: Habitat	11
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	10
	TOTAL SCORE	72

SR Tullahoma

W9

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

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Metric 2 Total 12.00

W10

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

W10

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland	X	filling/grading activities in or near the wetland
	dike(s), in or near the wetland	X	road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 17.00

W10

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma W10

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 15

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

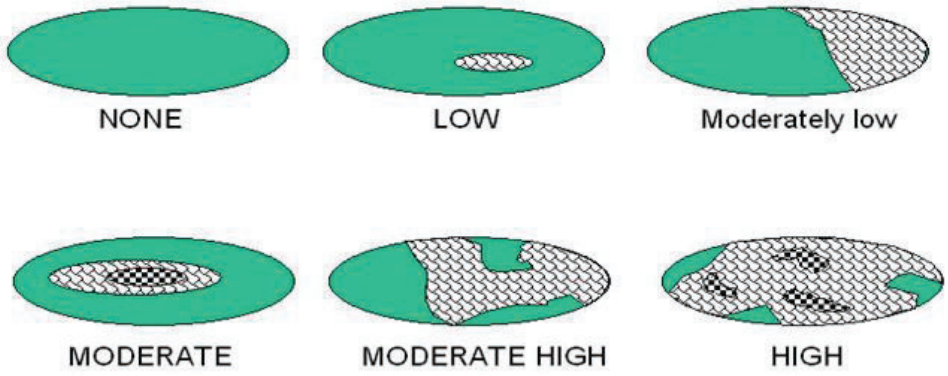

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	1
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	1
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	17
	Metric 4: Habitat	15
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	63

SR Tullahoma

W10

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	4
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 4

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

W11

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	1
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W11

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland	X	road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 14.00

W11

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	5
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 5.00

SR Tullahoma W11

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
X	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 14

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

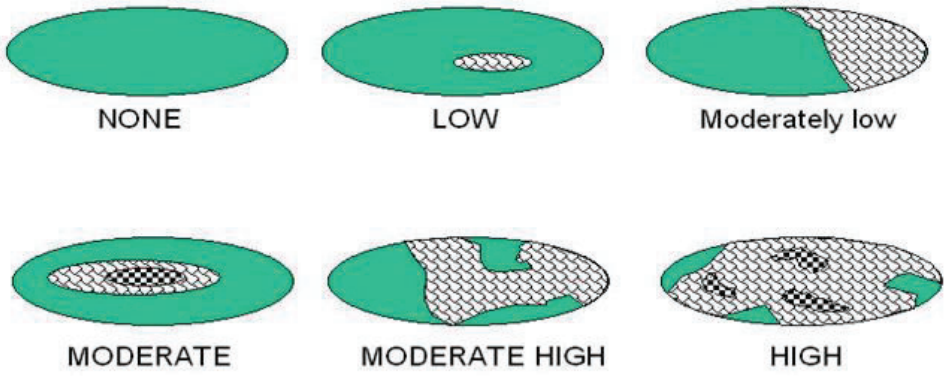

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	2
Coarse woody debris >15cm (6in) in diameter	1
Standing dead trees >25cm (10in) diameter at breast height	1
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 10

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	4
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	14
	Metric 4: Habitat	14
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	10
	TOTAL SCORE	64

SR Tullahoma

W11

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	6
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
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3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 6

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 9.00

W12

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

W12

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 17.00

W12

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 3.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	5
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 5.00

SR Tullahoma W12

Quantitative Rating
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4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 14

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 10

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	2
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

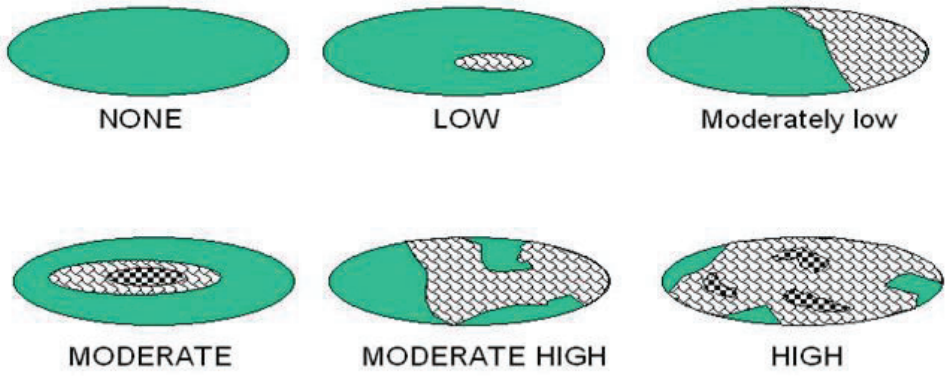

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	2
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 12

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	6
	Metric 2: Buffers and surrounding land use	9
	Metric 3: Hydrology	17
	Metric 4: Habitat	14
	Metric 5: Special Wetland Communities	10
	Metric 6: Plant communities, interspersion, microtopography	12
	TOTAL SCORE	68

SR Tullahoma

W12

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	3
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 3

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

W13

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	3
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	1
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	4
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 4.00

SR Tullahoma

W13

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	12
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
12.00

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Metric 3 Total 22.00

W13

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	6
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 6.00

SR Tullahoma W13

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
X	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 11

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
5	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
10	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 15

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	3
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	5
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

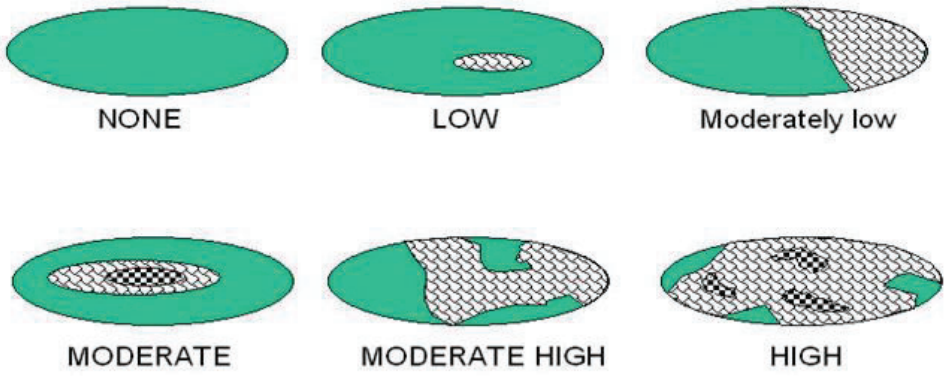

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	2
Standing dead trees >25cm (10in) diameter at breast height	2
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 16

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	3
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	22
	Metric 4: Habitat	11
	Metric 5: Special Wetland Communities	15
	Metric 6: Plant communities, interspersion, microtopography	16
	TOTAL SCORE	79

SR Tullahoma

W13

Rank = High

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.			
7pts	WIDE. >50m (164ft) or more around perimeter.		
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.		
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.		
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0	2a Avg.= 0.00
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.			
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.		
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.		
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.		2b Avg.= 5.00

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Metric 2 Total 5.00

W14

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W14

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 16.00

W14

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	4
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 4.00

SR Tullahoma W14

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 17

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	1
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

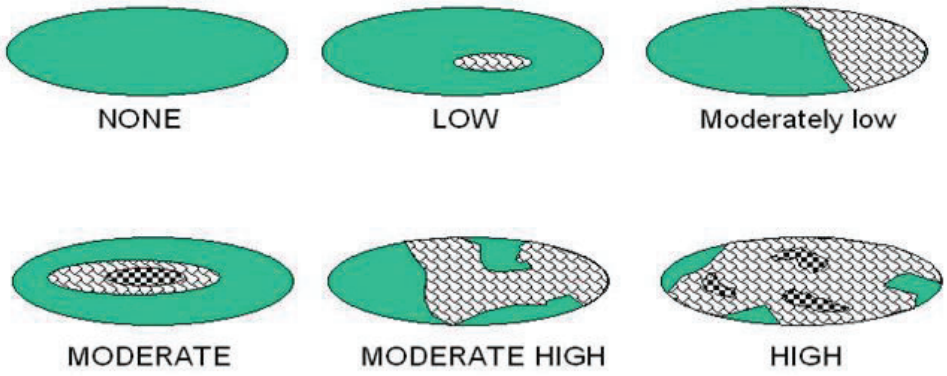

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	5
	Metric 3: Hydrology	16
	Metric 4: Habitat	17
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	47

SR Tullahoma

W14

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	0
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 0.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 5.00

W15

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W15

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 16.00

W15

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	4
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 4.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	4
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 4.00

SR Tullahoma W15

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	9
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 9.00

Metric 4 Total 17

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points). **6a. Wetland Vegetation Communities** Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	Score
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	1
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	1
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	3
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

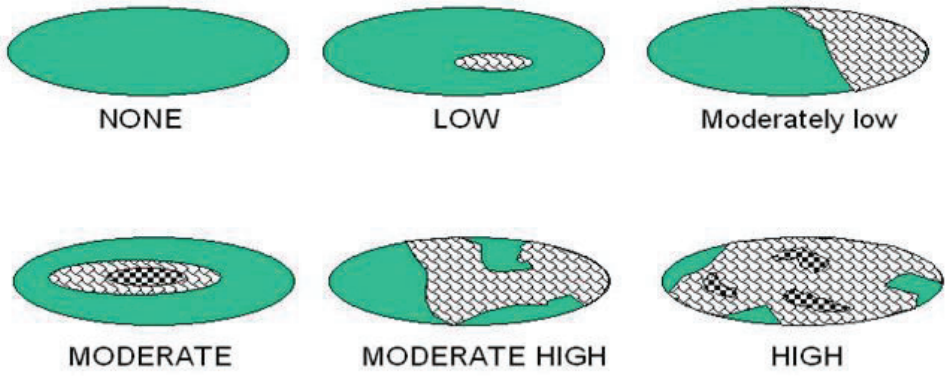

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	1
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	5
	Metric 3: Hydrology	16
	Metric 4: Habitat	17
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	46

SR Tullahoma

W15

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	1

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 1

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	7
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 7.00

SR Tullahoma

Metric 2 Total 11.00

W16

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	5
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	3
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 3.00

SR Tullahoma

W16

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	7
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
7.00

SR Tullahoma

Metric 3 Total 18.00

W16

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	3
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.=

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

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Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	6
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 6.00

Metric 4 Total 9

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	3
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

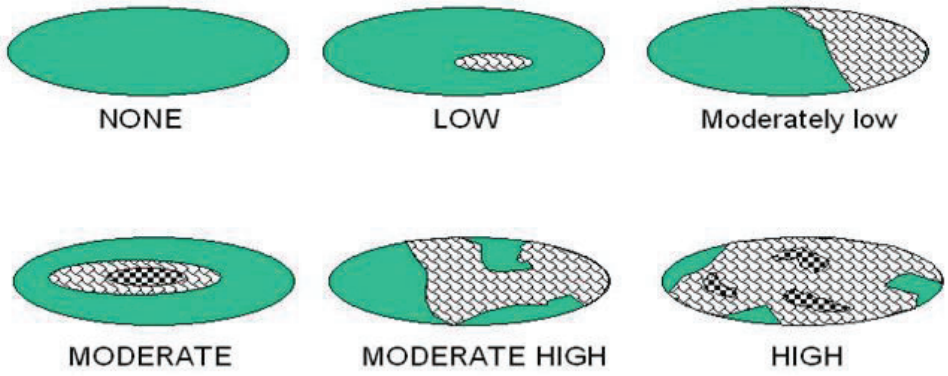

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	1
	Metric 2: Buffers and surrounding land use	11
	Metric 3: Hydrology	18
	Metric 4: Habitat	9
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	46

SR Tullahoma

W16

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	2
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 2

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	4
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 4.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 9.00

W17

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a p other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	1

3d Avg.= 1.00

SR Tullahoma

W17

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
3.00

SR Tullahoma

Metric 3 Total 10.00

W17

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	3
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 3.00

SR Tullahoma W17

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 8

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	2
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	2
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

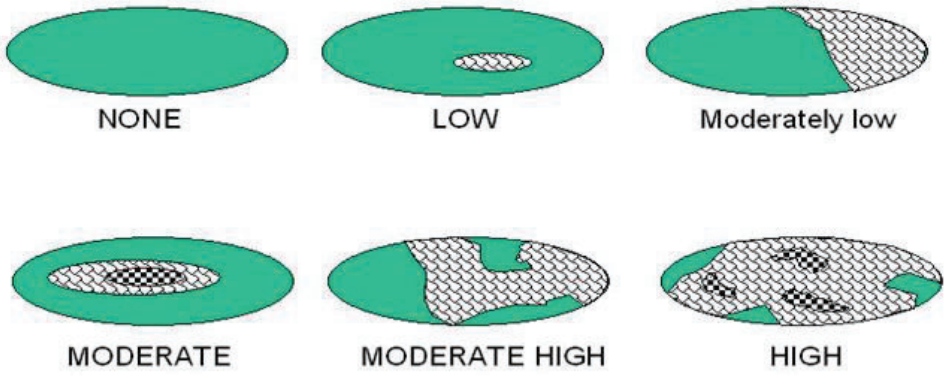

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	-1
0pt Nearly absent. <5% areal cover of invasive species	
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 3

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	2
	Metric 2: Buffers and surrounding land use	9
	Metric 3: Hydrology	10
	Metric 4: Habitat	8
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	3
	TOTAL SCORE	32

SR Tullahoma

W17

Rank = Low

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

Quantitative Rating

Tennessee Rapid Assessment Method

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	6
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres(west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres(west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	m on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total 6

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland "buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.		
7pts	WIDE. >50m (164ft) or more around perimeter.	7
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	
2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.		
7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	5
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

2a Avg.= 7.00

2b Avg.= 5.00

SR Tullahoma

Metric 2 Total 12.00

W18

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	1
3pts	Seasonal surface water	3
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream or river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from the adjacent land use could flow through wetland before it discharges into the surface water buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, mining, or residential uses.	1
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a other nearby wetland or upland habitat areas.	1
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	1
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	2
1pt	Seasonally saturated in the upper 30cm (12in) of soil	

3d Avg.= 2.00

SR Tullahoma

W18

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	3
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

3e Avg=
3.00

SR Tullahoma

Metric 3 Total 12.00

W18

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (circle all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	2
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4a Avg.= 2.00

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	4
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4b Avg.= 4.00

SR Tullahoma W18

Quantitative Rating
Tennessee Rapid Assessment Method

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		Score
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	3
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

4c Avg. = 3.00

Metric 4 Total 9

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
	5pts - >10m sq sphagnum or other moss or other vernal pools		5 pts - Superior fish, waterfowl, bat, or amphibian breeding habitat
	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)		5 pts - Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water water quality of 303(d) listed stream and/or to surface or and/or to ground water
	10 pts - Older-aged mature forested wetland avg. DBH >= 30 inches		10 pts - Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total 0

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	Score
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or 1000m^2 (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	2
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	1
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	Thee vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

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

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.	Score
5pts HIGH Wetland has a high degree of interspersion	
4pts MODERATELY HIGH Wetland has a moderately high degree of interspersion	4
3pts MODERATE Wetland has a moderate degree of interspersion	
2pts MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt LOW Wetland has a low degree of interspersion.	
0pt NONE Wetland has no plan view interspersion	

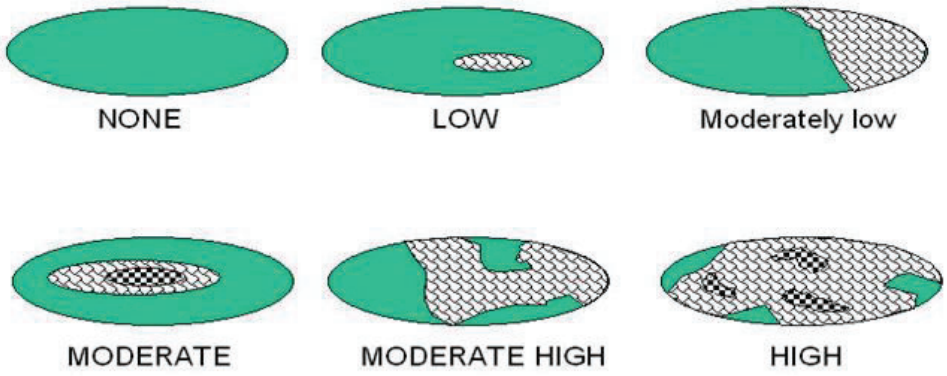

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	Score
-5pts Extensive >75% areal cover of invasive species	
-3pts Moderate 25-75% areal cover of invasive species	
-1pts Sparse 5-25% areal cover of invasive species	
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	
6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is 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 the highest quality

Metric 6 Total 7

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Rating	Metric 1: Size	6
	Metric 2: Buffers and surrounding land use	12
	Metric 3: Hydrology	12
	Metric 4: Habitat	9
	Metric 5: Special Wetland Communities	0
	Metric 6: Plant communities, interspersion, microtopography	7
	TOTAL SCORE	46

SR Tullahoma

W18

Rank = Moderate

"Wetland Conditions with an overall score of 100-75 are considered Exceptional Tennessee Waters. Wetlands with a score of 74-45 are considered to have moderate resource value, and wetland with a score of 44 and below have a low resource value."
TRAM 2015, pg 2)

COPPERHEAD
ENVIRONMENTAL CONSULTING

Draft Report

Listed Bat Presence/Probable Absence Survey for SRC/TO 213/Moore Site – Moore County, Tennessee

Submitted to:

Harriet L. Richardson Seacat, M.A.

Environmental Project Manager

HDR

440 S. Church Street, Suite 1000

Charlotte, NC 28202

14 June 2021

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
P.O. BOX 73 ■ 471 MAIN STREET ■ PAINT LICK, KENTUCKY 40461
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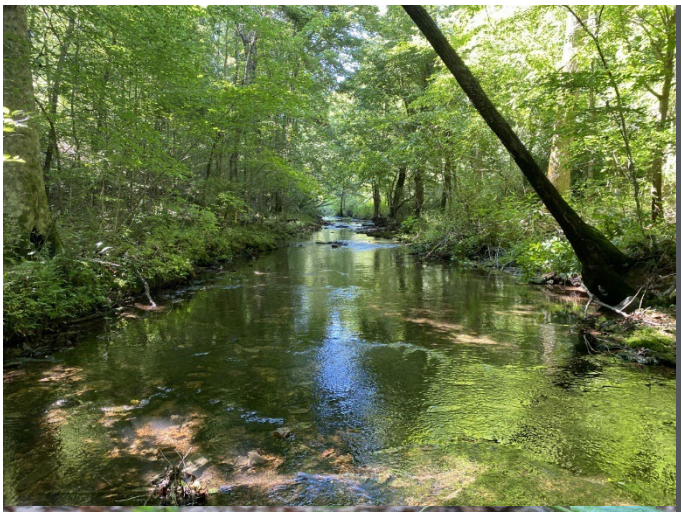

Wildlife and Vegetation Assessment - *Draft*

Moore County Solar

SR Tullahoma, LLC

Moore County, Tennessee

March 2022

TENNESSEE
VALLEY
AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

April 29, 2021

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA) POWER PURCHASE AGREEMENT (PPA) MOORE COUNTY SOLAR ARRAY MOORE COUNTY, TENNESSEE (TVA TRACKING NUMBER – CID 80060) (35.350211 -86.269295)

TVA is proposing to enter into a PPA with Silicon Ranch Tullahoma, LLC (SR Tullahoma) for a 200 megawatts solar photovoltaic (PV) generating facility located near Tullahoma, in Moore County, Tennessee (Figure 1)The facility would be located on an assemblage of parcels making up approximately3,312-acres. A portion of the study area is a pine plantation and actively logged. In addition, much of the property is the former Motlow Artillery Range, which was used by the Army during World War II (Figure 2). TVA proposes that the area of potential effects (APE) should be considered to be the footprint where ground disturbance could occur as a result of the undertaking including the proposed solar arrays and any supporting infrastructure as well as the 0.5 mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

SR Tullahoma contracted with New South Associates, Inc. (New South) to conduct a Phase I Cultural Resources survey. For your review, please find the proposed research design for the Phase I Cultural Resources survey, prepared by New South enclosed. Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the survey design presented here is a reasonable and good faith effort to carry out identification efforts.

By this letter, TVA is initiating consultation regarding the proposed undertaking. TVA is proposing to conduct Phase I Cultural Resources survey of the APE as described in the enclosed scope of work.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places.

If you have any questions or comments, please contact Michaelyn Harle by email at mharle@tva.gov.

Sincerely,

Clinton E. Jones
Manager
Cultural Compliance

MSH:ABM
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

April 29, 2021

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Purchase Power Agreement, Silicon Ranch Tullahooma, Moore County Solar Array, Tullahoma Moore County, TN

Dear Mr. Jones:

At your request, our office has reviewed the above-referenced cultural resources survey cope of work. This review is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the information provided, we find that the proposed survey methods are adequate for the identification of historic properties within the area of potential effect.

Your continued cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr. JB

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

From: Shuler, Marianne M <mmshuler@tva.gov>
Sent: Friday, April 30, 2021 3:01 PM
Subject: TVA-Moore County Solar Project-Initiation of Consultation-MooreCoTN-CID80060-30Apr2021

Good Afternoon
By this email I am sending the attached initiation of consultation letter regarding TVA's proposal to enter into a power purchase agreement with Silicon Ranch Tullahoma, LLC for a 200 megawatts solar photovoltaic generating facility located near Tullahoma, in Moore County, Tennessee.

Please let me know by May 30 if you have any questions or comments on the proposed undertaking or proposed Phase I survey.
Thanks
Marianne

Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.

-

Marianne Shuler
Senior Specialist, Archaeologist & Tribal Liaison
Cultural Compliance

Tennessee Valley Authority
400 W. Summit Hill Drive
Knoxville, TN 37902

(865)253-1265 (w)
mmshuler@tva.gov

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May 14, 2021

Ms. Marianne Shuler, Senior Specialist,
Archaeologist & Tribal Liaison
Cultural Compliance
Tennessee Valley Authority
400 W. Summit Hill Drive
460 WT 7D-K
Knoxville, TN 37902

Dear Ms. Shuler:

Thank you for the research design and a letter initiating consultation on a proposed power purchase agreement with Silicon Ranch Tullahoma, LLC for a solar photovoltaic generating facility in Moore County, Tennessee (CID 80060). We accept the invitation to consult under Section 106 of the National Historic Preservation Act.

The Chickasaw Nation concurs that the procedures outlined in the research design should adequately test the area to locate any potential cultural resources in the project area of potential effects. We wish to review the cultural resource report once it is available. In the event the agency becomes aware of the need to enforce other statutes we request to be notified under ARPA, AIRFA, NEPA, NAGPRA, NHPA and Professional Standards.

Your efforts to preserve and protect significant historic properties are appreciated. If you have any questions, please contact Ms. Karen Brunso, tribal historic preservation [redacted]

Sincerely,

Lisa John, Secretary
Department of Culture and Humanities

Cc: mmshuler@tva.gov

TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

September 8, 2021

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA) POWER PURCHASE AGREEMENT (PPA) MOORE COUNTY SOLAR ARRAY, MOORE COUNTY, TENNESSEE – REVISED PHASE I SURVEY SCOPE OF WORK (SOW) (TVA TRACKING NUMBER – CID 80060) (35.350211 - 86.269295)

In a letter dated April 29, TVA initiated consultation with your office regarding the proposed Moore County Solar Array. In the letter, we provided a SOW by New South and Associates (New South). The letter also stated that a portion of the study area is a pine plantation and was being actively logged. Currently, New South is conducting the Phase I survey of the survey area. During the ongoing survey, they identified several areas have been heavily modified due to past timbering operations on private property. New South recommends a change to the SOW based on the field results to date.

Many of the areas located on relatively flat ridgetops have been clear-cut and heavily modified, making them difficult and sometimes dangerous to access. Based on site conditions and results of portions of survey already completed that have identified heavily disturbed soil profiles, New South is proposing to modify the survey methodology within some of these upland locations shown in Figure 1. Shovel testing that has already occurred at these locations indicates the soils are eroded, with subsoil at or just below surface. When the subsoil is not exposed, shovel tests indicate a thin humic layer overlies subsoil. At these locations, there are areas with good ground visibility, but these areas are localized. There also are areas where the ground is inaccessible due to the piles of logging debris. These locations are away from water sources and typically do not have a high potential for archaeological deposits. The sites that have been identified as part of the current survey have been around the edges of these landforms closer to water sources. Based on this ongoing fieldwork, New South proposes to modify the SOW to expand the intervals within these to every third shovel test (90-meter grid) to confirm that the subsoil is at or near the surface. Pedestrian survey will be conducted in areas with good ground visibility. If any evidence of intact Holocene soils are identified New South will shift back to the 30-meter grid. In addition, if any cultural resources are identified the rest of the landform will be tested in a 30-meter grid.

By this letter, TVA is notifying you of the change in field methodology based on in-field site conditions. The proposed methodology is keeping within the *Tennessee SHPO Standards and Guidelines for Archaeological Resources Management Studies.*

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places.

Pursuant to 36 CFR § 800.4(b)(1), TVA finds that based on discussion with New South the survey redesign presented here is a reasonable and good faith effort to carry out identification efforts.

If you have any questions or comments, please contact Michaelyn Harle by email, mharle@tva.gov.

Sincerely,

Clinton E. Jones
Manager
Cultural Compliance

MSH:ABM
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

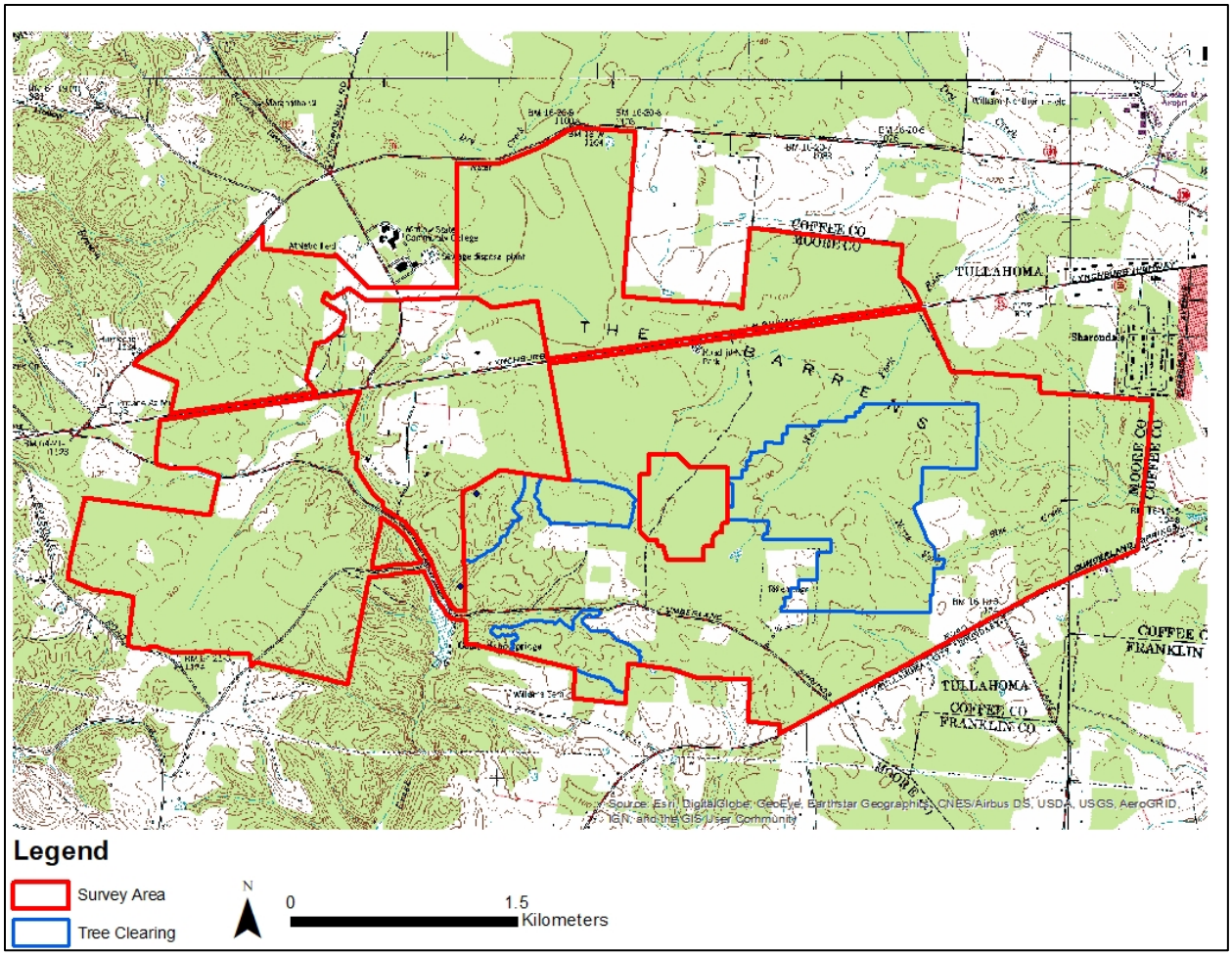

Figure 1: Location of the identified previous upland tree clearing.

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
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www.tnhistoricalcommission.org

September 9, 2021

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Purchase Power Agreement, Silicon Ranch Tullahooma, Moore County Solar Array (35.350211 -86.269295), CID 80060, Tullahoma Moore County, TN

Dear Mr. Jones:

At your request, our office has reviewed the revised survey scope of work for the above-referenced undertaking. This review is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the information provided, we find that the revised scope of work meets the Tennessee SHPO Standards and Guidelines for Archaeological Resource Management Studies.

Your continued cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr. JB

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

From: Pilakowski, Ashley Anne
To: RichardsonSeacat, Harriet
Subject: FW: TVA-Moore County Solar Project-REVISED Phase I SOW-
Date: Wednesday, September 8, 2021 12:41:08 PM
Attachments: image009.png
image010.png
image011.png
image012.png
image013.png
image014.png
image015.png
image016.png
image017.png
TVA_Moore County Solar Project_REVISED SOW_MooreCoTN_SHPO_CID80060_8Sept2021.pdf

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CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

FYI-

From: McCampbell, Amy Boardman <aboardma@tva.gov>
Sent: Wednesday, September 08, 2021 12:23 PM
To: Jones, Clinton E <cjones5@tva.gov>
Cc: Booker, Dawn <sdbooker@tva.gov>; Easley, Michael C <mceasley@tva.gov>; Harle, Michaelyn S <mharle@tva.gov>; Hartline, Brandon Joseph <bjhartline@tva.gov>; Jacks, Susan R <srjacks@tva.gov>; Nelson, Dana Marie <dmball@tva.gov>; Pilakowski, Ashley Anne <aapilakowski@tva.gov>; Tolene, Rebecca Chunn <rctolene@tva.gov>; Wells, Bryan <wbwells@tva.gov>; White, William Douglas <wdwhite0@tva.gov>; Pickell, Teresa B <tbpickell@tva.gov>
Subject: RE: TVA-Moore County Solar Project-REVISED Phase I SOW-

Hello,

For your records, the attached letter has been sent to the TN SHPO. A tribal letter has also been sent as appropriate.

Thanks,

Amy McCampbell
Business Support Representative
Federally Mandated Environmental Compliance

TENNESSEE VALLEY AUTHORITY

W. 865-632-2931 **M.** 865-250-9640 **E.** aboardman@tva.gov
400 West Summit Hill Drive, Knoxville, TN 37902

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From: Shuler, Marianne M <mmshuler@tva.gov>
Sent: Wednesday, September 8, 2021 10:06 AM
Subject: TVA-Moore County Solar Project-REVISED Phase I SOW-
Importance: High

Good Morning
By this email I am sending the enclosed letter regarding TVA's proposed Moore County Solar Project located in Moore County, Tennessee. TVA previously consulted with your office on the proposed Phase I scope of work in April of this year. The Phase I survey is currently being conducted.

TVA is now proposing to revise the Phase I scope of work based on field results. The proposed revised scope of work is enclosed for your review.

As field work is currently on going, TVA respectfully requests for any comments on the proposed revision **by September 15th**. If there are no concerns with this proposed change the revised field methodology will begin on Sept 16th.

Thank you
Marianne

Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.

-

Marianne Shuler
Senior Specialist, Archaeologist & Tribal Liaison
Cultural Compliance

Tennessee Valley Authority
400 W. Summit Hill Drive
Knoxville, TN 37902

(865)253-1265 (w)
mmshuler@tva.gov

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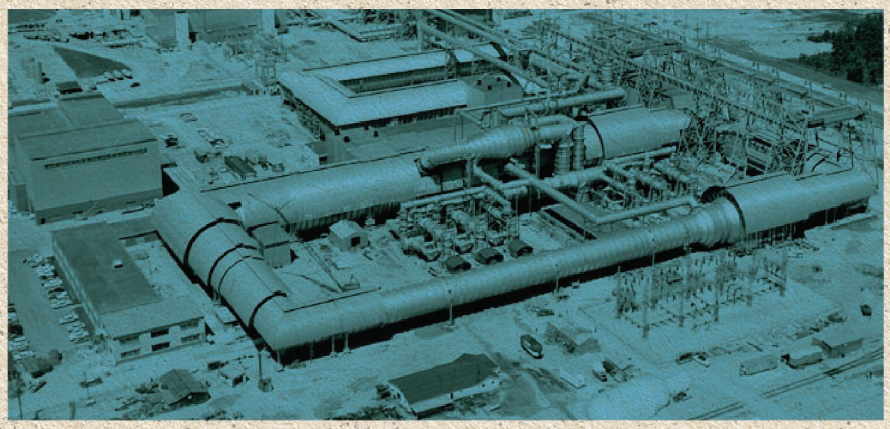
immediately by email and delete the original message.

PHASE I CULTURAL RESOURCES SURVEY OF THE PROPOSED MOORE COUNTY SOLAR FARM SITE

MOORE COUNTY, TENNESSEE



NEW SOUTH ASSOCIATES, INC.

Phase I Cultural Resources Survey of the Proposed Moore County Solar Farm Site

Moore County, Tennessee

Contract 30020907, Task Order 213, Purchase Order 2606

Report submitted to

HDR, Inc. • 440 South Church Street, Suite 1000 • Charlotte, North Carolina 28202

Report prepared by

New South Associates • 6150 East Ponce de Leon Avenue • Stone Mountain, Georgia 30083
and
New South Associates • 1629 Fatherland Street • Nashville, Tennessee 37206

Danny Gregory, RPA – Principal Investigator

Caleb Hutson, RPA – Archaeologist and Co-Author
Paul Hoffman – Historian and Co-Author
Ashley Cavanaugh – Archaeologist and Co-Author
Kelly Higgins – Archaeologist and Co-Author

February 4, 2022 • Draft Report
New South Associates Technical Report 4249

Archaeological Survey for the Transmission Line Upgrades Associated with Moore County Solar

Moore and Franklin Counties, Tennessee

March 2022

By: Laura Short
Paloa Lopez-Magana
Mary Schmidt
Jessica Forbes

Principal Investigator: Laura Short, Ph.D., R.P.A.

Archaeological Survey for the Transmission Line Upgrades Associated with Moore County Solar

Moore and Franklin Counties, Tennessee

By:

Laura Short

Paola Lopez-Magana

Mary Schmidt

Jessica Forbes

Principal Investigator:

Laura Short, Ph.D., R.P.A.

Prepared for:

Silicon Ranch Corporation

222 Second Ave S, Suite 1900

Nashville, TN 37201

Prepared by:

17111 Preston Rd, Suite 300
Dallas, TX 75248

March 2022

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Appendix B – Scoping Documentation

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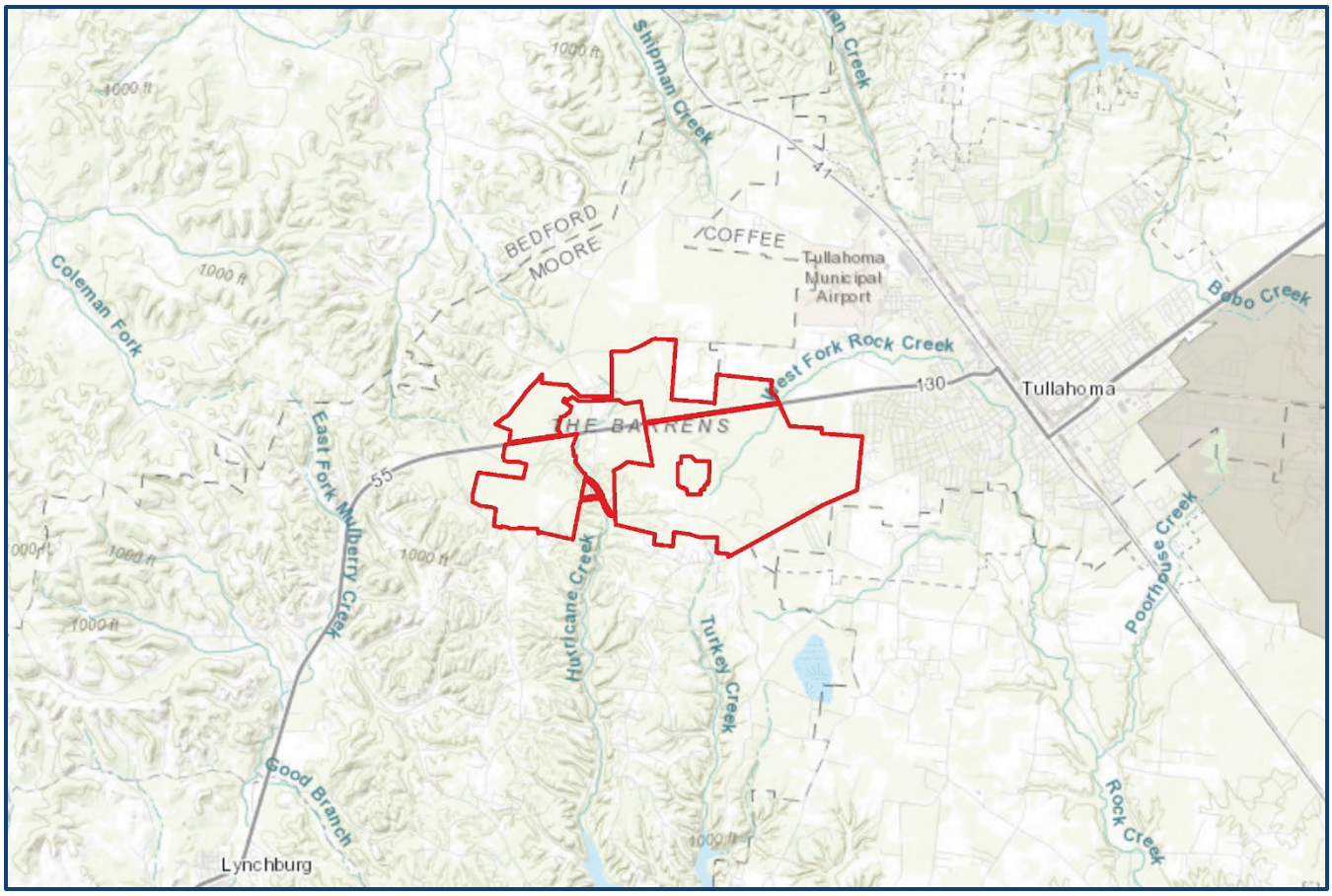
Document Type: EIS – Administrative Record
Index Field: Scoping Report
Project Name: Moore County Solar
Project Number: 2021-15

Moore County Solar

SCOPING REPORT

SEPTEMBER 3, 2021



TENNESSEE VALLEY AUTHORITY

Scoping Report Executive Summary

Tennessee Valley Authority (TVA) is preparing an environmental impact statement (EIS) to assess the potential environmental effects of a proposed solar photovoltaic (PV) facility in Moore County, Tennessee, known as Moore County Solar. The solar facility would be constructed within a project site measuring approximately 3,463 acres, of which approximately 2,000 acres are necessary to develop a 200-megawatt (MW) alternating current (AC) solar facility. The project site is bisected by State Route 55 and is within the metropolitan limits of Lynchburg, Tennessee (Figure 1). Moore County Solar would connect to the TVA Franklin-Wartrace No. 2 161-kilovolt (kV) transmission line (TL), which runs through the project site, and require upgrades on approximately 9.6 miles of this TL (Figure 2). Together, the solar facility and the TL upgrades are referred to herein as the Project.

In June 2019, TVA completed the final 2019 Integrated Resource Plan (IRP) and associated EIS. The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The 2019 IRP recommends solar expansion and anticipates growth in all scenarios analyzed. TVA has entered into a power purchase agreement (PPA) with SR Tullahoma LLC (SR Tullahoma), a subsidiary of Silicon Ranch Corporation, to purchase 200 MW AC of power generated by the Project. This PPA will help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and help fulfill the renewable energy goals established in the 2019 IRP. The PPA is contingent upon the completion of an environmental review. The purpose of this is to address the potential environmental effects associated with constructing, operating, maintaining, and decommissioning the solar PV facility on the project site in Moore County.

The EIS will assess a No Action Alternative and an Action Alternative. The Action Alternative would execute the PPA to purchase 200 MW AC of power generated by the proposed facility. SR Tullahoma would construct, operate, maintain, and eventually decommission a 200-MW AC solar PV facility, as described above, within a footprint that avoids environmental resources to the maximum extent possible. Under the No Action Alternative, TVA would not execute the PPA, and SR Tullahoma would not develop, operate, maintain, or decommission a solar PV facility at this location.

The National Environmental Policy Act (NEPA) requires federal agencies to consider the potential environmental consequences of their proposed actions. An EIS should provide full and fair discussion of significant environmental impacts and should inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts. TVA initiated a 30-day public scoping period on May 3, 2021, when it published a Notice of Intent in the *Federal Register* announcing its plan to prepare an EIS or an environmental assessment (EA). During the scoping period, from May 3, 2021, to June 4, 2021, the public provided input to help TVA identify issues of concern and to help lay the foundation for development of the EIS or EA.

Based on the scoping comments that TVA received, as well as the results of ongoing field surveys and other considerations, TVA decided

that the appropriate level of review for the Project is an EIS. This scoping report presents the public comments received, as well as information on how the EIS is being developed.

During the scoping period, TVA received comments from two federal agencies, one state agency, one non-governmental organization, and two private individuals. Comments were related to purpose and need, agency coordination, alternatives, mitigation measures, land use, water resources, biological resources, air quality and greenhouse gas (GHG) emissions, socioeconomics, and environmental justice. This scoping report also includes information about NEPA, federal and local laws, and executive orders that are relevant to the proposed action.

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Appendix B – National Historic Preservation Act Initial Section 106 Coordination

Appendix C – Public and Agency Comments

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AC	Alternating current
BMP	Best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DC	Direct current
EA	Environmental assessment
EIS	Environmental impact statement
EO	Executive Order
GHG	Greenhouse gas
IRP	Integrated Resource Plan
kV	Kilovolt
MVT	Mid-voltage transformer
MW	Megawatt
NEPA	National Environmental Policy Act
NOI	Notice of Intent
PPA	Power purchase agreement
PV	Photovoltaic
RFP	Request for proposal
ROW	Right-of-way
SR	Silicon Ranch
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment & Conservation
THC	Tennessee Historical Commission
TL	Transmission line
TVA	Tennessee Valley Authority
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
U.S.	United States

1 Introduction

Tennessee Valley Authority (TVA) is a self-financed, wholly owned corporate agency of the United States that serves a region that consists of parts of seven Southeastern states. As a public power entity, TVA has no shareholders and receives no tax dollars. Under the TVA Act of 1933, as amended, Congress charged TVA with advancing the social and economic well-being of the residents of the Tennessee Valley region. TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed the final 2019 Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS). The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The target supply mix adopted by TVA in the 2019 IRP recommends solar expansion in all scenarios analyzed, with most scenarios anticipating 5,000-8,000 MW and one anticipating up to 14,000 MW by 2038.

Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources in 2020. As an outcome of this RFP process, TVA entered into a power purchase agreement (PPA) with SR Tullahoma LLC (SR Tullahoma), a subsidiary of Silicon Ranch Corporation, to purchase 200 megawatts (MW) alternating current (AC) of power generated by the proposed solar photovoltaic (PV) facility contingent upon the completion of an environmental review. The facility, known as Moore County Solar, would be located within an approximately 3,463-acre project site in Moore County, Tennessee. SR Tullahoma would construct, operate, maintain, and eventually decommission Moore County Solar. A substation and facilities to interconnect the solar PV facility to the TVA Franklin-Wartrace No. 2 161-kilovolt (kV) transmission line (TL), as well as upgrades on approximately 9.6 miles of this TL, would also be required to operate the solar facility. Together, the solar facility and the TL upgrades are referred to herein as the Project.

The project site consists of 3,463 acres, of which approximately 2,000 acres would be necessary to develop the solar facility. The project site is bisected by State Route 55 and is within the metropolitan limits of Lynchburg, Tennessee. The site is mostly forested, with areas of wetlands, croplands, and early successional fields. TVA's Franklin-Wartrace No. 2 161- kV TL extends north-south through the project site.

TVA initiated the public scoping process for the Project with the publication of a notice of intent (NOI) in the *Federal Register* on May 3, 2021. In the NOI, TVA stated that it was initiating the preparation of either an EIS or an environmental assessment (EA) to address the potential environmental impacts of the Project. Through the NOI and other public notices, TVA requested comments on the scope of the environmental review and environmental issues that should be addressed. TVA also requested data, information, and analyses relevant to the proposed action.

Based on the scoping comments that TVA received, as well as the site size, results of ongoing field surveys, and a preliminary determination of anticipated environmental impacts on natural resources, TVA determined that the appropriate level of review is an EIS.

TVA is preparing the subject EIS to assess the potential environmental effects associated with constructing, operating, maintaining, and decommissioning the Project.

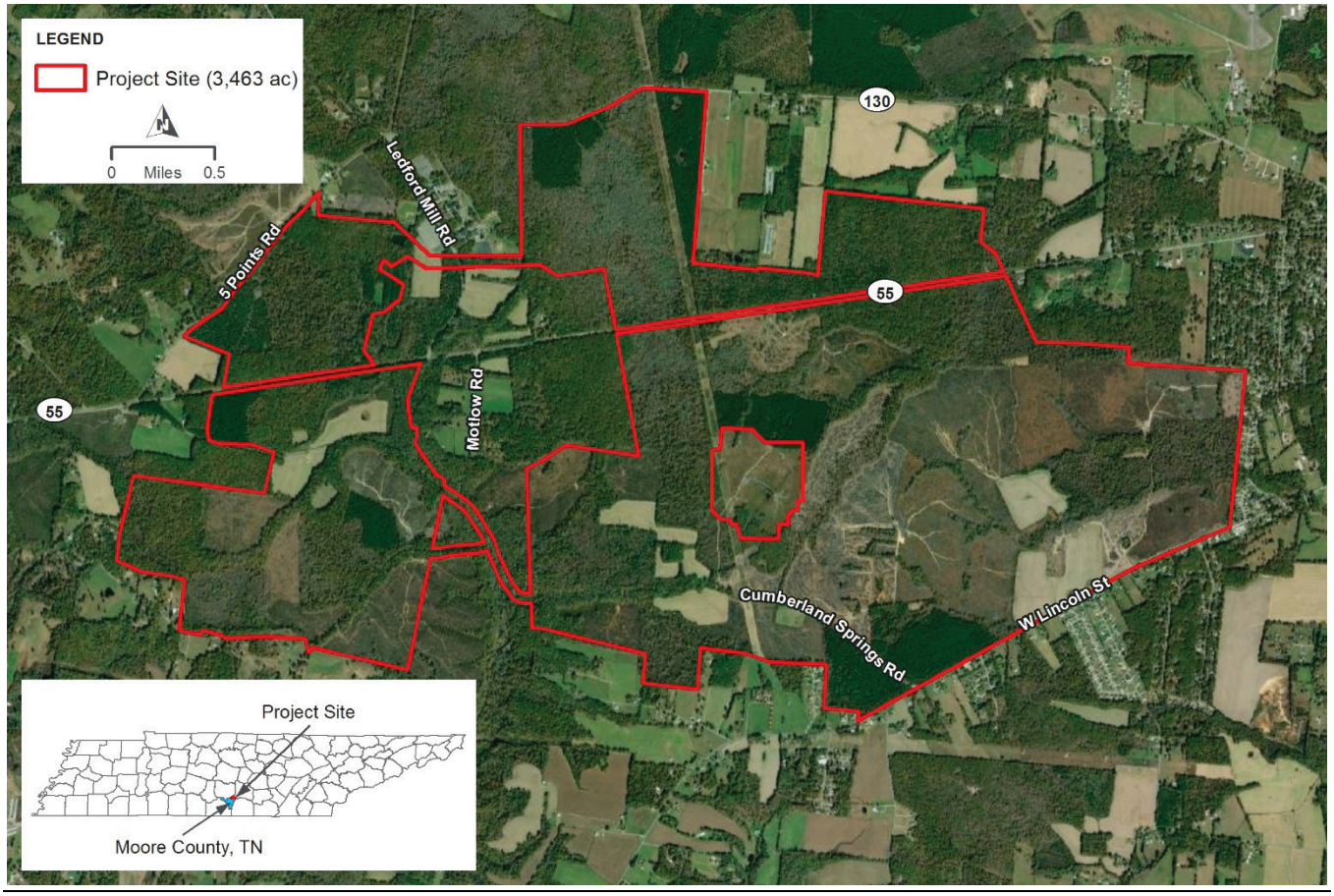

Figure 1. Project Site Location.

2 Purpose and Need

Customer demand for cleaner energy prompted TVA to release an RFP for renewable energy resources (2020 Renewable RFP). The PPA associated with the Project that resulted from this RFP will help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP. The proposed action would provide cost-effective renewable energy consistent with the IRP and TVA goals.

3 Alternatives

As a result of preliminary internal scoping by TVA and comments received during public scoping, TVA has determined that, from the standpoint of the National Environmental Policy Act (NEPA), there is one reasonable alternative, the Action Alternative, which meets the purpose and need. As required by NEPA, the EIS will also address the No Action Alternative. Variations of the Action Alternative that TVA considered but eliminated from detailed study will be described in the EIS.

3.1 No Action Alternative

Under the No Action Alternative, TVA would not execute the PPA, and SR Tullahoma would not develop, operate, maintain, and decommission Moore County Solar. Existing conditions (land use, natural resources, visual resources, physical resources, and socioeconomics) on the project site and in the vicinity would remain unchanged. TVA would continue to rely on other sources of generation described in the 2019 IRP to ensure an adequate energy supply and to meet its goals for increased renewable energy and low greenhouse gas (GHG)-emitting generation.

3.2 Action Alternative

Under the Action Alternative, TVA would execute the PPA to purchase 200 MW AC of power generated by the proposed solar PV facility. The facility would be located within the approximately 3,463-acre project site (Figure 1). SR Tullahoma would construct, operate, maintain, and decommission the solar facility within a 2,000-acre footprint that avoids cultural, biological, and physical resources to the maximum extent possible. During the operation of the solar facility, SR Tullahoma would maintain a herd of sheep on the facility site to help control the growth of tall vegetation and reduce mowing needs. The Project would connect to TVA's existing adjacent Franklin-Wartrace No. 2 161-kV TL that extends north-south through the project site. To interconnect to TVA's existing electrical grid, TVA would build an on-site 161-kV substation, if necessary, and replace the existing overhead ground wire with new fiber-optic overhead ground wire along an approximately 9.6-mile portion of the Franklin-Wartrace No. 2 161-kV TL (Figure 2).

The Project would convert sunlight into direct current (DC) electrical energy within PV panels (modules). PV power generation is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current is produced, which can be used as electricity.

The Project would be composed of PV modules mounted together in arrays. Groups of panels would be connected electrically in series to form "strings" of panels, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project's high design temperature. The panels would be arranged in individual blocks consisting of the PV arrays and an inverter station on a concrete pad or steel piles, to convert the DC electricity generated by the solar panels into AC electricity. Each inverter would be collocated with a mid-voltage transformer (MVT), which would step-up the AC voltage to minimize the AC cabling electrical losses between the central inverters and the proposed on-site 161-kV substation. Underground AC power cables would connect the MVTs to a single main power transformer, located within the substation. The arrays and inverter block areas would be enclosed by chain-link security fencing. The portions of the project site outside the fenced-in areas would not be developed.

The modules would be attached to single-axis trackers. The axis trackers would be attached to steel pile foundations and pivot the panels along their north-south axes to follow the path of the sun from the east to the west across the sky.

Other temporary or permanent Project components would include construction laydown areas, buildings, and security and communications equipment. Also, if determined necessary, the Project may include water wells and a septic system or a pump-out septic holding tank. Compacted gravel access roads would provide access to each inverter block, the substation, and to any buildings.

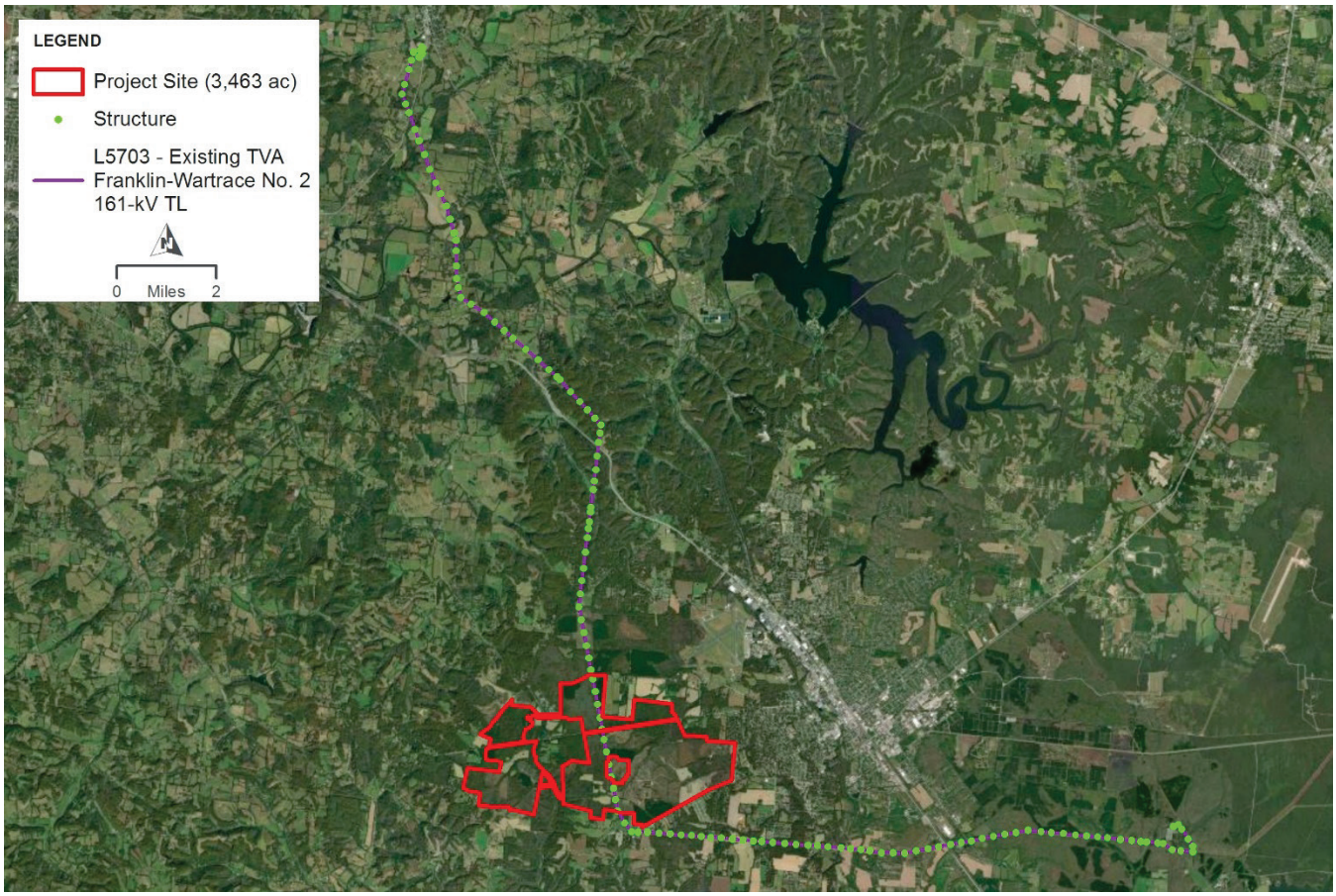

Figure 2. Entire Franklin-Wartrace No. 2 161-kV TL

4 Environmental Review Process

NEPA requires federal agencies to consider and study the potential environmental consequences of their proposed actions. Actions, in this context, can include new and continuing activities that are conducted, financed, assisted, regulated or approved by federal agencies, as well as new or revised plans, policies, or procedures. An EIS should provide full and fair discussion of significant environmental impacts and should inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.

TVA is initiating the preparation of an EIS to assess the environmental impacts of the proposed action. TVA is using the input from the public scoping period in developing the Draft EIS. The Draft EIS will be posted on TVA's website and distributed to interested federal, state, and local agencies, individuals, and groups, including

scoping participants, for their review and comment. Following this public comment period, TVA will respond to the comments received and incorporate any necessary changes into the Final EIS. TVA will make a final decision regarding the proposed action no sooner than 30 days after the Final EIS is published.

The completed Final EIS will be posted on TVA's website, and notices of its availability will be sent to those who received the Draft EIS or submitted comments on the Draft EIS. TVA intends to publish the Draft EIS in early 2022 and publish the Final EIS by mid-2022.

4.1 Applicable Federal Laws and Executive Orders

4.1.1 National Environmental Policy Act

This EIS is being prepared by TVA in accordance with NEPA (42 United States Code §§ 4321 et seq.), regulations implementing NEPA promulgated by the Council on Environmental Quality (40 CFR Parts 1500 to 1508), and TVA NEPA regulations (18 CFR 1318) and procedures.

4.1.2 Other Laws and Executive Orders

Other laws and Executive Orders (EOs) are relevant to the proposed action (Table 1). These laws and orders may affect the environmental consequences of the solar PV facility or represent mitigation measures to implement during its construction, operation, or decommissioning. The Draft EIS will describe the regulatory setting for each environmental resource in more detail.

Table 1. Laws and Executive Orders relevant to the Proposed Action.

Environmental Resource Area	Law / Executive Order
Prime Farmland	Farmland Protection Policy Act
Water Resources	Clean Water Act EO 11988 – Floodplain Management EO 11990 – Protection of Wetlands Resource Conservation and Recovery Act Safe Drinking Water Act
Biological Resources	Bald and Golden Eagle Protection Act Endangered Species Act EO 13112 – Invasive Species EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds Migratory Bird Treaty Act
Air Quality and GHG Emissions	Clean Air Act

Environmental Resource Area	Law / Executive Order
Cultural Resources	National Historic Preservation Act Native American Graves Protection and Repatriation Act
Solid and Hazardous Waste	Comprehensive Environmental Response, Compensation, and Liability Act Emergency Planning and Community Right-to-Know Act Resource Conservation and Recovery Act Solid Waste Disposal Act Toxic Substances Control Act
Public and Occupational Health and Safety	Occupational Safety and Health Act
Environmental Justice	EO 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

4.2 Environmental Resources to Be Considered in EIS

Based on internal and public scoping, identification of applicable laws, regulations, executive orders, and policies, TVA identified the following resource areas as requiring review within the EIS:

- Land Use
- Geology, Soils, and Prime Farmland
- Water Resources
  - Groundwater
  - Surface Water and Wetlands
  - Floodplains
- Biological Resources
  - Vegetation
  - Wildlife
  - Aquatic Life
  - Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Visual Resources
- Noise
- Air Quality and GHG Emissions
- Cultural Resources
- Utilities
- Solid and Hazardous Waste Management
- Public Health and Safety
- Transportation
- Socioeconomics
- Environmental Justice

5 Public and Agency Outreach

On May 3, 2021, TVA published a Notice of Intent (NOI) in the *Federal Register* announcing that it planned to prepare either an EIS or an EA to assess the potential environmental effects associated with constructing, operating, maintaining, and decommissioning the Project (Appendix A). The NOI initiated a 30-day public scoping period, which concluded on June 4, 2021. The NOI solicited public input on both the scope of the EIS or EA and the environmental

issues that should be considered in the EIS or EA. It also requested data, information, and analyses relevant to the proposed action.

In addition to the NOI in the *Federal Register*, TVA sent notification of the NOI to local and state government entities and federal agencies, issued a Project news release in *Moore County News*, and posted the news release on the TVA website. TVA sent the scoping notice via email to agencies and organizations.

As part of its National Historic Preservation Act compliance responsibilities, TVA initiated consultation with federally recognized tribes and the Tennessee Historical Commission (THC), which functions as the Tennessee State Historic Preservation Office, in April 2021 (Appendix B).

6 Response to Public Scoping

During the scoping period, comments were received from the U.S. Geological Survey; U.S. Environmental Protection Agency (USEPA); Tennessee Natural Heritage Program, part of the Tennessee Department of Environment and Conservation (TDEC); Southeastern Grasslands Initiative; and two private individuals. Comments were related to purpose and need, agency coordination, alternatives, mitigation measures, land use, water resources, biological resources, air quality and GHG emissions, socioeconomics, and environmental justice. Comment summaries and full submissions, along with TVA's responses, are included in Appendix C, and summarized in this section. Mitigation measures are presented in Section 7, including those related to the scoping comments.

6.1 Scope of the EIS

TVA will analyze the potential adverse and beneficial impacts related to the construction, operation, maintenance, and decommissioning of the Project. TVA will also analyze the potential impacts related to the associated modifications to the TVA transmission system. In addition to the environmental resources listed in Section 4.2, TVA will analyze the cumulative impacts of the Project with consideration of any reasonably foreseeable actions and other anticipated changes in the vicinity of the project site during the operation of the solar facility. TVA will also describe how the Project would provide cost-effective renewable energy consistent with the 2019 IRP and TVA goals.

6.2 Response to Scoping Comments

Comments were received regarding several topics. A brief summary of TVA's response or planned approach to these items in the EIS is presented by topic below.

Purpose and Need

In planning its energy portfolio in the 2019 IRP, TVA considered the intermittent availability of solar generation and is compensating for this by operating a diverse portfolio of types of generation, an adequate reserve margin to compensate for the loss of individual generating facilities, and a well-maintained interconnected transmission grid.

Agency Coordination

The Project is coordinating with TDEC and U.S. Army Corps of Engineers (USACE) on the surface water resources identified on the project site and will do so for the TL upgrade locations, as well.

TVA will provide notice to potentially interested state and federal agencies when the Draft EIS is available for review and comment.

Alternatives
In its 2019 IRP EIS, TVA considered land use efficiency of solar energy development in the TVA region and ultimately recommended the expansion of solar generating capacity. TVA will evaluate dual use of the project site as a solar facility and a commercial sheep operation in the EIS.

Silicon Ranch Corporation reviewed other sites prior to selecting the project site. Part of the screening process included a review of interconnection options, including key entry points to the TVA transmission system. The project site in Moore County stood out as a viable option for transmission system connectivity. The EIS will describe the site selection process completed during Project planning.

Mitigation Measures
If needed, the Project will consider environmental conservation and enhancement efforts, in coordination with state and federal agencies, as potential mitigation measures.

Water Resources
TVA will evaluate potential impacts to surface waters, as well as to floodplains, stormwater, and other water resources in the EIS.

Biological Resources
TVA compiled lists of rare plants and animals from TDEC, as well as from the U.S. Fish and Wildlife Service and TVA's Regional Natural Heritage Database, for the Project area. TVA will evaluate potential impacts to biological resources in the EIS. This evaluation will include detailed field surveys of biological resources, including the presence of rare plants and animals, suitable habitat for the rare species, and rare natural communities.

Air Quality and GHG Emissions
TVA will evaluate potential air quality and GHG emissions impacts in accordance with NEPA requirements as reflected in current regulations and recent Council on Environmental Quality guidance. This analysis will include the Project effects on carbon sequestration.

Socioeconomics
TVA will evaluate potential impacts to employment in the EIS. TVA will consider how reduced energy costs from solar may be relevant to the socioeconomic analysis presented in the EIS.

Environmental Justice
TVA will evaluate potential impacts to minority and low-income populations in the EIS in accordance with EO 12898 and associated CEQ and USEPA guidance. TVA will also comply with EO 13166, Improving Access to Services for Persons with Limited English Proficiency, if applicable in the Project area, in public notifications for the Project.

7 Potential Mitigation Measures

TVA and SR Tullahoma would implement minimization and mitigation measures in relation to resources potentially affected by the Project. These would be developed with consideration to best management practices (BMPs), permit requirements, and adherence to the Stormwater Pollution Prevention Plan (SWPPP).

In association with the proposed electrical interconnection, TVA would employ standard practices and specific routine measures to avoid and minimize impacts to resources. Some comments received during the scoping period offered specific mitigation measures for the proposed action. During development of the EIS, TVA will consider implementation of the following minimization and mitigation measures in relation to potentially affected resources.

Visual Resources
Use timer- and/or motion-activated downward facing lighting to limit visual effects at night.

Soils
Install silt fence along the perimeter of vegetation-cleared areas, implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations, and make an effort to balance cut-and-fill quantities to alleviate the transportation of soils offsite during construction.

Water Resources
Comply with the terms of the SWPPP prepared as part of the National Pollutant Discharge Elimination System permitting process; use BMPs for controlling soil erosion and runoff, such as the use of buffer zones surrounding perennial and intermittent streams as well as wetlands and natural ponds and the installation of erosion control silt fences and sediment traps; and implement other routine BMPs as necessary, such as non-mechanical tree removal within surface water buffers, placement of silt fence and sediment traps along buffer edges, selective herbicide treatment to restrict application near receiving water features, and proper vehicle maintenance to reduce the potential for adverse impacts to surface water and groundwater. Impacts to water resources deemed jurisdictional to TDEC and USACE would be permitted in compliance with the Clean Water Act Sections 401 and 404. The Project would also implement mitigation measures as defined in TVA's 1981 *Class Review of Repetitive Actions in the 100-Year Floodplain*, if needed.

Biological Resources
Revegetate with native and/or noninvasive vegetation, including plants attractive to pollinators, to reintroduce habitat, reduce erosion, limit the spread of invasive species (per EO 13112 (Invasive Species)); follow U.S. Fish and Wildlife recommendations regarding biological resources, including pollinator species; avoid, to the extent practicable, siting generation equipment and associated infrastructure in areas that support state-listed plant species and rare plant habitats; use timer- and/or motion-activated downward facing lighting to limit attracting wildlife, particularly migratory birds and bats; instruct personnel on wildlife resource protection measures, including applicable federal and state laws such as those that prohibit animal disturbance, collection, or removal, the importance of protecting wildlife resources, and avoiding plant disturbance; and use only USEPA-registered and TVA-approved herbicides in accordance with label directions designed, in part, to restrict applications near receiving waters and to prevent unacceptable aquatic impacts.

Solid and Hazardous Waste Management
Develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials.

Public Health and Safety
Implement BMPs for site safety management to minimize potential risks to workers.

Transportation
Implement a traffic management plan to manage construction traffic flow near the project site.

Noise
Limit construction activities primarily to daytime hours and ensure that heavy equipment, machinery, and vehicles utilized at the project site meet all federal, state, and local noise requirements.

Air Quality and GHG Emissions
Comply with local ordinances or burn permits if burning of vegetative debris is required and use BMPs such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust.

A

Appendix A – *Federal Register* Notice of Intent

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This document is scheduled to be published in the Federal Register on 05/03/2021 and available online at **federalregister.gov/d/2021-09223**, and on **govinfo.gov**

8120-08-P

TENNESSEE VALLEY AUTHORITY

Moore County Solar Project

AGENCY: Tennessee Valley Authority.

ACTION: Notice of Intent; request for comments.

SUMMARY: The Tennessee Valley Authority (TVA) intends to prepare an environmental impact statement (EIS) or environmental assessment (EA) for the purchase of electricity generated by the proposed Moore County Solar Project in Moore County, Tennessee. The EIS or EA will assess the potential environmental effects of constructing, operating, and maintaining the proposed 200-megawatt (MW) alternating current (AC) solar facility. The proposed 200 MW AC solar facility would occupy approximately 2,000 acres of the roughly 3,300-acre Project Study Area. Public comments are invited concerning both the scope of the environmental review and environmental issues that should be addressed in the EIS or EA. TVA is also requesting data, information, and analysis relevant to the proposed action from the public; affected federal, state, tribal, and local governments, agencies, and offices; the scientific community; industry; or any other interested party.

DATES: To ensure consideration, comments must be postmarked, emailed, or submitted online no later than June 4, 2021.

ADDRESSES: Written comments should be sent to Ashley Pilakowski, NEPA Specialist, Tennessee Valley Authority, 400 West Summit Hill Drive, WT 11B, Knoxville, Tennessee 37902. Comments may be submitted online at: www.tva.gov/nepa, or by email to nepa@tva.gov. Please note that, due to current TVA requirements for many employees to work remotely, comments submitted electronically are encouraged.

FOR FURTHER INFORMATION CONTACT: Ashley Pilakowski by email at aapilakowski@tva.gov, by phone at (865) 632-2256, or by mail at the address above.

SUPPLEMENTARY INFORMATION: This notice is provided in accordance with the Council on Environmental Quality's regulations 40 CFR Parts 1500 to 1508 (84 FR 43304, July 16, 2020) and TVA's procedures for implementing the National Environmental Policy Act (NEPA) at 18 CFR Part 1318, as well as Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800). Following site investigations and a preliminary determination of the anticipated environmental impacts, TVA will decide whether the proposed action will be the subject of an EIS or EA.

TVA is a federal agency and instrumentality of the United States, created in 1933 by an act of Congress to foster the social and economic well-being of the residents of the Tennessee Valley region. As part of its diversified energy strategy, TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear.

Background

In June 2019, TVA completed the final 2019 Integrated Resource Plan (IRP) and associated EIS. The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The 2019 IRP recommends solar expansion and anticipates growth in all scenarios analyzed, with most scenarios anticipating 5,000-8,000 MW and one anticipating up to 14,000 MW by 2038. Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (2020 Renewable RFP). The Moore County Solar Project power purchase agreement (PPA) that resulted from this RFP will help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP.

TVA has entered into a PPA with Silicon Ranch Corporation to purchase 200 MW AC of power generated by the proposed Moore County Solar Project, hereafter referred to as the project. The proposed 200 MW AC solar facility would occupy approximately 2,000 acres of the roughly 3,300-acre Project Study Area which is located entirely in Moore County, Tennessee. The project site is bisected by State Route 55 and its eastern boundary borders the western city limits of Tullahoma, Tennessee. The project site is mostly forested with areas of wetlands, croplands, and early successional fields. A TVA 161-kilovolt transmission line runs north-south through the site. A map showing the project site is available at www.tva.gov/nepa.

Preliminary Proposed Action and Alternatives

In addition to a No Action Alternative, TVA will evaluate the action alternative of purchasing power from the proposed Moore County Solar Project. In evaluating alternatives, TVA considered other solar proposals, prior to selecting the Moore County site. Part of the screening process included a review of transmission options, including key connection points to TVA's transmission system. The Moore County site stood out as a viable option for connectivity. For the proposed site, the solar developer plans to consider the establishment of a reduced footprint so that impacts to cultural and/or biological resources could be avoided. The EIS or EA will also evaluate ways to mitigate impacts that cannot be avoided. The description and analysis of these alternatives in the EIS or EA will inform decision makers, other agencies, and the public about the potential for environmental impacts associated with the proposed solar facility. TVA solicits comments on whether there are other alternatives that should be assessed in the EIS or EA.

Brief Summary of Expected Impacts

Public scoping is integral to the process for implementing NEPA and ensures that (1) issues are identified early and properly studied, (2) issues of little significance do not

consume substantial time and effort, and (3) the analysis of identified issues is thorough and balanced. This EA or EIS will identify the purpose and need of the project and will contain descriptions of the existing environmental and socioeconomic resources within the area that could be affected by the proposed solar facility, including the documented historical, cultural, and environmental resources. Evaluation of potential environmental impacts to these resources will include, but not be limited to, air quality and greenhouse gas emissions, surface water, groundwater, wetlands, floodplains, vegetation, wildlife, threatened and endangered species, land use, natural areas and parks and recreation, geology, soils, prime farmland, visual resources, noise, cultural resources, socioeconomics and environmental justice, solid and hazardous waste, public and occupational health and safety, utilities, and transportation.

Based on a preliminary evaluation of these resources, TVA expects potential impacts to vegetation and wildlife due to the conversion of coniferous and hardwood forests of various ages to early maintained grass-dominated fields. Impacts to water resources would likely be minor with the use of best management practices and avoidance of siting project components in or near streams, wetlands, and riparian areas to the extent feasible. Land use would be impacted by the conversion of the undeveloped site to industrial use and the elimination of current farming and timber operations. This would also result in visual impacts. The current recreational uses of the site, primarily hunting, would also be eliminated. Historic properties could be impacted but would be avoided to the extent feasible or mitigated in compliance with applicable regulations. Nearly half of the site was once used as an auxiliary training area for the U.S. Army during World War II. The site was deactivated in 1946 and the U.S. Army Corps of Engineers has conducted numerous inspections and remediation efforts on the former Motlow Range to ensure public and occupational health and safety. Beneficial impacts are expected by facilitating the development of renewable energy and thereby increasing local job opportunities, as

well as improving regional air quality and reducing carbon emissions. The EIS or EA will analyze measures that would avoid, minimize, or mitigate environmental effects. The final range of issues to be addressed in the environmental review will be determined, in part, from scoping comments received.

Request for Identification of Potential Alternatives, Information, and Analyses Relevant to the Proposed Action

TVA requests assistance with identifying any new potential alternatives to the proposed action to be considered. TVA also requests assistance with identifying any new potential impacts of the proposed action, identifying the activity and the potential impact that should be analyzed. Information interested parties possess which would assist in the analysis of resources issues is also appreciated. TVA is particularly interested in public input on other reasonable alternatives that should be considered in the EIS or EA. The preliminary identification of reasonable alternatives, information, and analyses relevant to the proposed action in this notice is not meant to be exhaustive or final.

Public Participation

The public is invited to submit comments on the scope of this EA or EIS no later than the date identified in the **DATES** section of this notice. Federal, state, and local agencies and Native American Tribes are also invited to provide comments. Information about this project is available on the TVA web page at www.tva.gov/nepa, including a link to an online public comment page. Any comments received, including names and addresses, will become part of the administrative record and will be available for public inspection. After consideration of comments received during the scoping period, TVA will develop and distribute a scoping document that will summarize public and agency comments that were received and identify the schedule for completing the EIS or EA process. Following analysis of the issues, TVA will prepare the draft EIS or EA for public review and comment; expected to be released late 2021 or early 2022. TVA anticipates the final EIS

or EA in summer of 2022. In finalizing the EIS or EA and in making its final decision, TVA will consider the comments that it receives on the draft.

Rebecca Tolene,

Vice President,

Environment.

[FR Doc. 2021-09223 Filed: 4/30/2021 8:45 am; Publication Date: 5/3/2021]

B

Appendix B – National Historic Preservation Act Initial Section 106 Coordination

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TENNESSEE
VALLEY
AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

April 29, 2021

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA) POWER PURCHASE AGREEMENT (PPA) MOORE COUNTY SOLAR ARRAY MOORE COUNTY, TENNESSEE (TVA TRACKING NUMBER – CID 80060) (35.350211 -86.269295)

TVA is proposing to enter into a PPA with Silicon Ranch Tullahoma, LLC (SR Tullahoma) for a 200 megawatts solar photovoltaic (PV) generating facility located near Tullahoma, in Moore County, Tennessee (Figure 1)The facility would be located on an assemblage of parcels making up approximately3,312-acres. A portion of the study area is a pine plantation and actively logged. In addition, much of the property is the former Motlow Artillery Range, which was used by the Army during World War II (Figure 2). TVA proposes that the area of potential effects (APE) should be considered to be the footprint where ground disturbance could occur as a result of the undertaking including the proposed solar arrays and any supporting infrastructure as well as the 0.5 mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

SR Tullahoma contracted with New South Associates, Inc. (New South) to conduct a Phase I Cultural Resources survey. For your review, please find the proposed research design for the Phase I Cultural Resources survey, prepared by New South enclosed. Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the survey design presented here is a reasonable and good faith effort to carry out identification efforts.

By this letter, TVA is initiating consultation regarding the proposed undertaking. TVA is proposing to conduct Phase I Cultural Resources survey of the APE as described in the enclosed scope of work.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places.

If you have any questions or comments, please contact Michaelyn Harle by email at mharle@tva.gov.

Sincerely,

Clinton E. Jones
Manager
Cultural Compliance

MSH:ABM
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

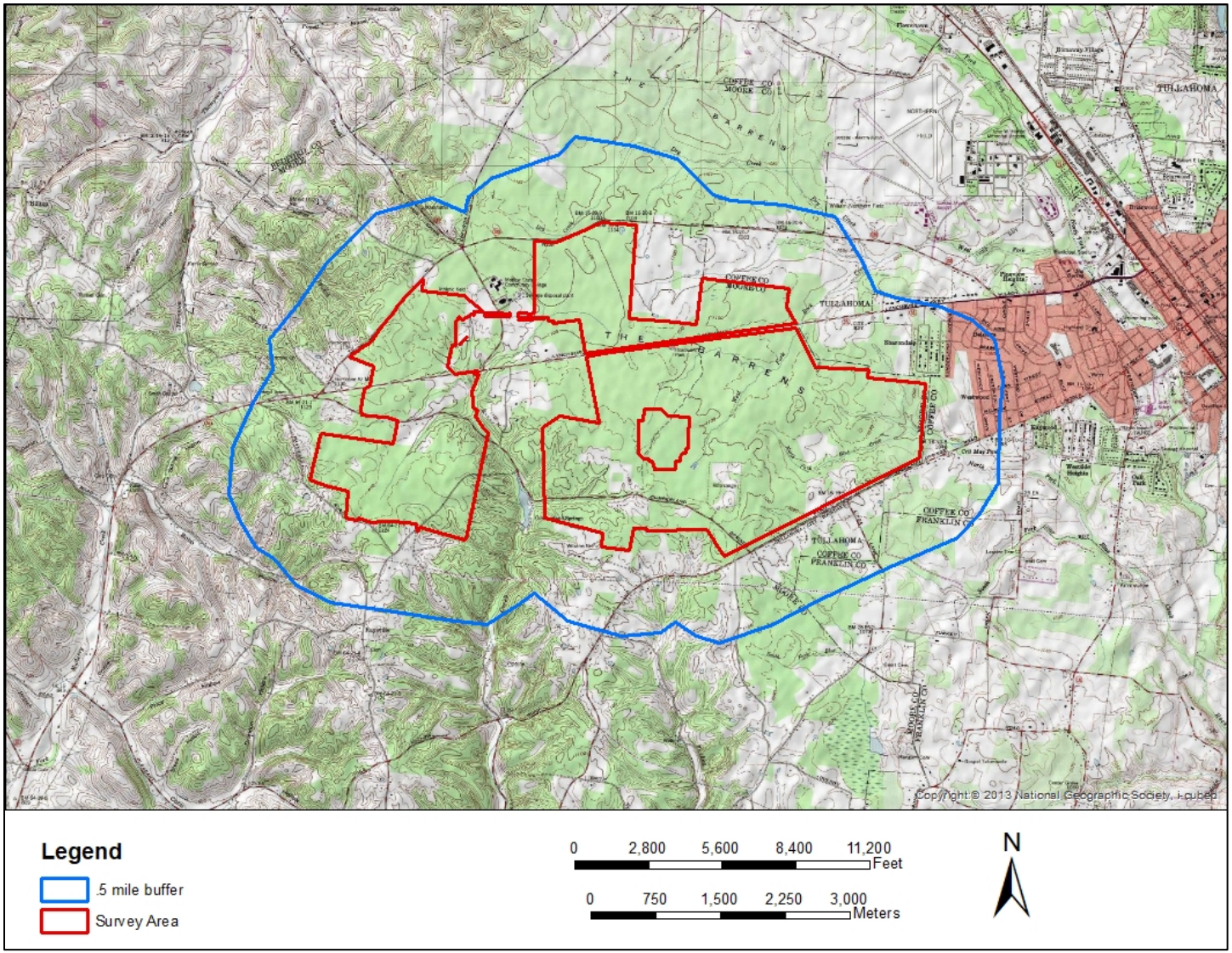

Figure 1. Location of the proposed solar array with 0.5-mile buffer.

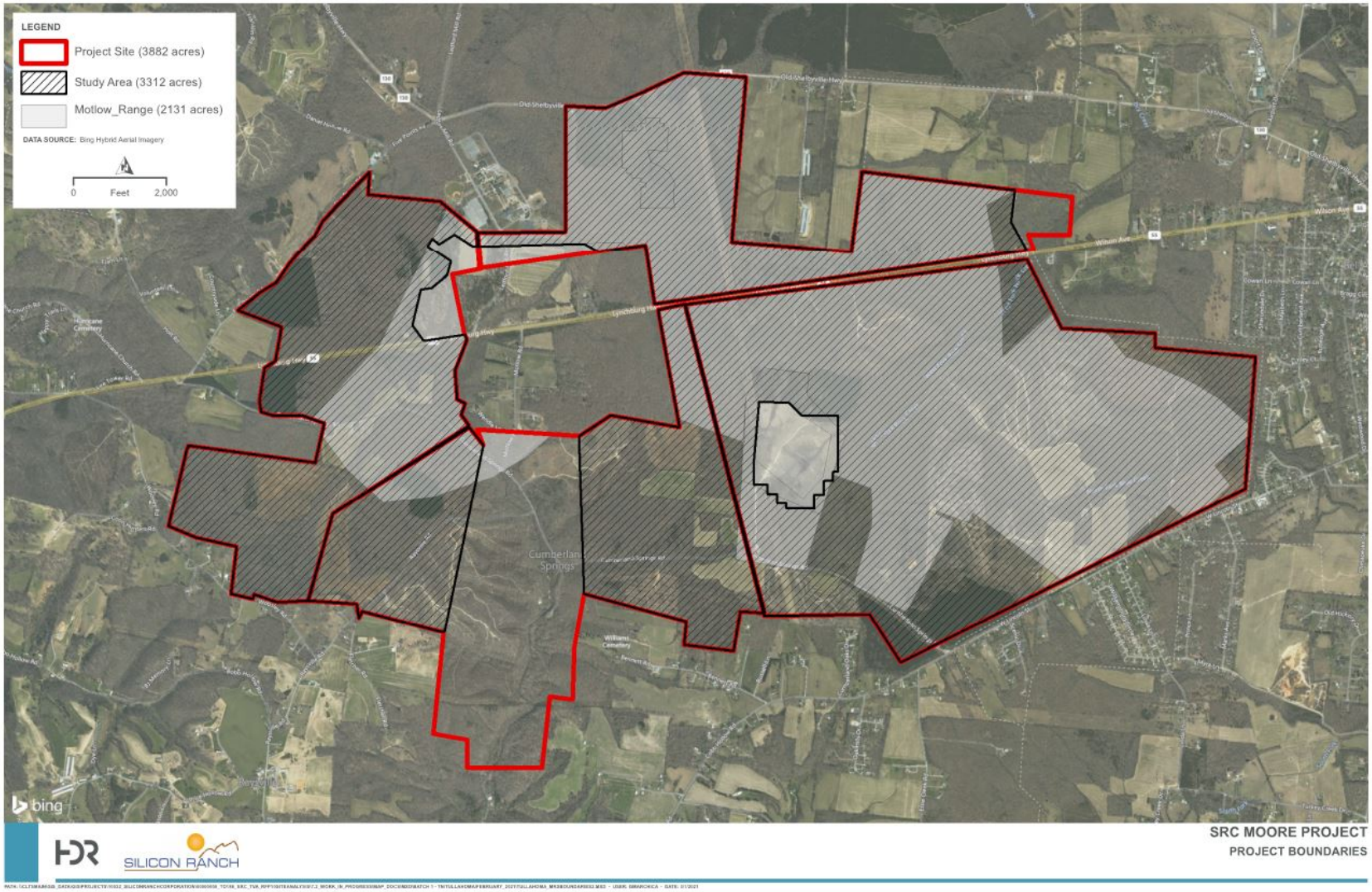

Figure 2: Aerial depicting the survey area and the location of the former Motlow Artillery Range

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

April 29, 2021

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Purchase Power Agreement, Silicon Ranch Tullahooma, Moore County Solar Array, Tullahoma Moore County, TN

Dear Mr. Jones:

At your request, our office has reviewed the above-referenced cultural resources survey cope of work. This review is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the information provided, we find that the proposed survey methods are adequate for the identification of historic properties within the area of potential effect.

Your continued cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr. JB

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

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From: Shuler, Marianne M <mmshuler@tva.gov>
Sent: Friday, April 30, 2021 3:01 PM
Subject: TVA-Moore County Solar Project-Initiation of Consultation-MooreCoTN-CID80060-30Apr2021

Good Afternoon
By this email I am sending the attached initiation of consultation letter regarding TVA's proposal to enter into a power purchase agreement with Silicon Ranch Tullahoma, LLC for a 200 megawatts solar photovoltaic generating facility located near Tullahoma, in Moore County, Tennessee.

Please let me know by May 30 if you have any questions or comments on the proposed undertaking or proposed Phase I survey.
Thanks
Marianne

Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.

-

Marianne Shuler
Senior Specialist, Archaeologist & Tribal Liaison
Cultural Compliance

Tennessee Valley Authority
400 W. Summit Hill Drive
Knoxville, TN 37902

(865)253-1265 (w)
mmshuler@tva.gov

NOTICE: This electronic message transmission contains information that may be TVA SENSITIVE, TVA RESTRICTED, or TVA CONFIDENTIAL. Any misuse or unauthorized disclosure can result in both civil and criminal penalties. If you are not the intended recipient, be aware that any disclosure, copying, distribution, or use of the content of this information is prohibited. If you have received this communication in error, please notify me immediately by email and delete the original message.

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May 14, 2021

Ms. Marianne Shuler, Senior Specialist,
Archaeologist & Tribal Liaison
Cultural Compliance
Tennessee Valley Authority
400 W. Summit Hill Drive
460 WT 7D-K
Knoxville, TN 37902

Dear Ms. Shuler:

Thank you for the research design and a letter initiating consultation on a proposed power purchase agreement with Silicon Ranch Tullahoma, LLC for a solar photovoltaic generating facility in Moore County, Tennessee (CID 80060). We accept the invitation to consult under Section 106 of the National Historic Preservation Act.

The Chickasaw Nation concurs that the procedures outlined in the research design should adequately test the area to locate any potential cultural resources in the project area of potential effects. We wish to review the cultural resource report once it is available. In the event the agency becomes aware of the need to enforce other statutes we request to be notified under ARPA, AIRFA, NEPA, NAGPRA, NHPA and Professional Standards.

Your efforts to preserve and protect significant historic properties are appreciated. If you have any questions, please contact Ms. Karen Brunso, tribal historic preservation officer, at (580) 272-1106, or by email at karen.brunso@chickasaw.net.

Sincerely,

Lisa John, Secretary
Department of Culture and Humanities

Cc: mmshuler@tva.gov

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C

Appendix C – Public and Agency Comments

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Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
1	NOI	Agency Coordination	The US Geological Survey (USGS) has no comment until the EIS is ready for review.	Brett Kopec, US Geological Survey	Comment noted.
2	NOI	General	General support for the project.	Lakshya Bharadwaj	Comment noted.
3	NOI	Purpose and Need	Comment asking whether solar energy is "possible," suggesting it could be devastating in some areas of our daily life and referencing the early February 2021 loss of power in Texas wherein renewable energy was blamed for lack of reliability. Suggestion that people should watch what we put into the atmosphere and that we "repair and reinforce" the current power infrastructure.	Brenda Russell	TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, coal, natural gas, and nuclear. TVA's 2019 Integrated Resource Plan (IRP) identified the various resources that TVA intends to use to meet the energy needs of the TVA region over a 20-year planning period, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts. The 2019 IRP recommends the expansion of solar generating capacity of up to 14,000 megawatts by 2038, as well as expansion or retirement of other existing power infrastructure. The Project would partially fulfill the renewable energy goals established in the 2019 IRP by providing cost-effective renewable energy. In planning its energy portfolio, TVA considered the intermittent availability of solar generation and is compensating for this by operating a diverse portfolio of types of generation, an adequate reserve margin to compensate for the loss of individual generating facilities, and a well-maintained interconnected transmission grid.
4	NOI	Alternatives; NEPA analyses	The US Environmental Protection Agency (EPA) appreciates TVA's efforts toward developing and analyzing an appropriate amount of alternative project proposals. The EPA recommends including details of considered alternatives within the NEPA documents. Please consider using the NEPAssist tool (https://www.epa.gov/nepa/nepassist), in addition to localized data sources and tools, when conducting the NEPA analysis.	Douglas White, US Environmental Protection Agency	Silicon Ranch Corporation reviewed other sites prior to selecting the project site. Part of the screening process included a review of interconnection options, including key entry points to the TVA transmission system. The project site in Moore County stood out as a viable option for connectivity. The EIS will describe the site selection process completed during Project planning.
5	NOI	Air Quality and GHGs; Water Resources	Statement that solar energy emits 95 percent fewer greenhouse gases than energy derived from fossil fuels and has no water requirements.	Lakshya Bharadwaj	Comment noted.

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
6	NOI	Air Quality and GHGs	The US Environmental Protection Agency (EPA) recommends that net greenhouse gas (GHG) emissions related to this proposal and TVA's 2019 Integrated Resource Plan be considered in the NEPA analysis. Additionally, this project site is within an attainment area for air quality standards; however, localized impacts to air quality could occur during construction due to equipment exhaust emissions and fugitive dust. The EPA recommends implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with newer cleaner engines, replacing older vehicles, and reducing idling through operator training and/or contracting policies. We also encourage controlling fugitive dust by watering or the application of other controlled materials.	Douglas White, US Environmental Protection Agency	TVA will evaluate potential air quality and GHG emissions impacts in accordance with NEPA requirements as reflected in current regulations and recent Council on Environmental Quality guidance. If warranted, this would include consideration of mitigation measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, and reducing idling through operator training. The Project would ensure vehicles are properly maintained. TVA and SR Tullahoma would comply with local ordinances and the requirements of open-burning permits if open burning of vegetative debris is required and use best management practices such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust.
7	NOI	Alternatives; Air Quality and GHGs	The proposed action provides TVA an opportunity to study land use efficiency of solar energy development in the Tennessee Valley region. Local climate, ecosystems, and agriculture affect the net benefit of photovoltaic solar infrastructure regarding carbon release and sequestration. The US Environmental Protection Agency (EPA) recommends consideration of dual land use where land use efficiency can be increased (https://www.energy.gov/eere/solar/farmers-guide-going-solar).	Douglas White, US Environmental Protection Agency	In its 2019 Integrated Resource Plan (IRP) EIS, TVA considered land use efficiency of solar energy development in the TVA region (see Sections 5.2.3.5, 5.2.3.6, and 5.5.5) and ultimately recommended the expansion of solar generating capacity. TVA will evaluate dual use of the project site as a solar facility and a commercial sheep operation in the EIS. TVA will evaluate the Project effects to carbon sequestration compared with the No Action Alternative in the EIS.
8	NOI	Surface Water; Floodplains	The proposed action is situated in a predominantly forested area home to interspersed creeks and wetlands. The US Environmental Protection Agency (EPA) recommends that design proposals and construction avoid impacting these Waters of the United States (WOTUS) to the maximum extent practicable by locating permanent proposed infrastructure and temporary construction measures away from WOTUS and respective buffers. WOTUS should be delineated and coordination with the US Army Corps of Engineers (USACE) should be made where proposed activities might enter or affect WOTUS. Flood water mapping should occur to ensure proposed activities do not take place in floodplains except where alternatives are not practicable.	Douglas White, US Environmental Protection Agency	TVA will evaluate potential impacts to wetlands, streams, floodplains, and other water resources in the EIS. The proposed solar facility would be designed to incorporate measures to avoid streams and wetlands, identified by field surveys, to the maximum extent possible. TVA and SR Tullahoma would implement best management practices such as avoidance buffers surrounding surface waters and comply with all terms and conditions of a USACE Nationwide or Individual permit, if needed. TVA and SR Tullahoma would also implement mitigation measures as defined in TVA's 1981 *Class Review of Repetitive Actions in the 100-Year Floodplain* , if needed.

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
9	NOI	Stormwater	The proposed action has the potential to disturb a considerable amount of soil, and a state or county construction stormwater permit will likely be required before construction can begin. Construction stormwater runoff may impact surface water bodies and best management practices should be applied to protect these water bodies before and after construction.	Douglas White, US Environmental Protection Agency	TVA will evaluate potential impacts to stormwater in the EIS. TVA and SR Tullahoma would comply with the terms of the Stormwater Pollution Prevention Plan prepared as part of the National Pollutant Discharge Elimination System permitting process to control soil erosion and runoff, such as the installation of erosion control silt fences and sediment traps. TVA and SR Tullahoma would also implement other routine best management practices as necessary, such as selective herbicide treatment to restrict application near receiving water features and proper vehicle maintenance to reduce the potential for adverse impacts to surface water and groundwater.
10	NOI	Mitigation Measures; Biological Resources	Portions of the study area have exceptional potential for protection and management as a regionally important natural area, especially in support of the restoration of oak savanna grasslands and associated wetlands. The limited ecological and biological work that has been done in the study area has identified several wet grassland species on the Tennessee Rare Plant List, including short-leaved panic grass (*Dichanthelium ensifolium* subsp. *curtifolium*), button sedge (*Carex bullata*), dwarf sundew (*Drosera brevifolia*), yellow crested orchid (*Platanthera cristata*), and Tennessee featherbells (*Stenanthium tennessense*), the latter being globally imperiled. Powerline and roadside rights-of-way in the study area contain remnants of the grassland flora, including rare species, endemic to the region prior to fire suppression. These corridors, along with their nearby woodlands, are high priority sites for conservation. The ponds in the study area may harbor rare species and natural communities and would benefit from restoration. While solar production is likely suitable for some sections of the property, for those areas that are the most ecologically sensitive, we see the potential for coupling preservation of rare species, ecological restoration, and public education and outreach.	Dwyane Estes (Southeastern Grasslands Initiative)	TVA will evaluate potential impacts to biological resources in the EIS. TVA's analyses will include whether or not rare species and natural communities are known or potentially present in the study area or immediate vicinity via species habitat and/or presence/absence surveys, as also discussed in Comment No. 15. If needed, TVA and SR Tullahoma will consider conservation and environmental enhancement efforts, in coordination with state and federal agencies, as potential mitigation measures.
11	NOI	Socioeconomics	Statement that solar energy creates more jobs per Terawatt-hour (TWh), at 2,200/TWh, than the oil industry, at 1,000/TWh. The commenter further implies that this makes solar energy an economically viable source of renewable energy.	Lakshya Bharadwaj	TVA will evaluate potential impacts to employment in the EIS. TVA will consider how reduced energy costs from solar may be relevant to the socioeconomic analysis presented in the EIS.

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
12	NOI	Socioeconomics	Statement that the decision to purchase solar energy can promote community awareness and community solar farms, the latter of which are known to reduce electricity bills by 10 to 15 percent.	Lakshya Bharadwaj	Comment noted.
13	NOI	Environmental Justice	Ensure protected populations are not disproportionately or adversely impacted by the project. The US Environmental Protection Agency (EPA) also promotes compliance with Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, if applicable. Please use the EJSCREEN tool (https://www.epa.gov/ejscreen) as part of the NEPA analysis process.	Douglas White, US Environmental Protection Agency	TVA will evaluate potential impacts to minority and low-income populations, also known as environmental justice populations or "protected populations," in the EIS in accordance with EO 12898 and associated CEQ and USEPA guidance using US Census Bureau data and other state and local socioeconomic data, as appropriate. TVA will also comply with EO 13166, Improving Access to Services for Persons with Limited English Proficiency, if applicable in the project area, in public notifications for the Project.
14	NOI	Surface Water	Soil maps indicate the presence of hydric soils at the site suggest that coordination with Tennessee Department of Environment and Conservation (TDEC) and possibly the US Army Corps of Engineers (USACE) will be required for stream and wetland protection.	Dillon Blankenship, Tennessee Department of Environment and Conservation, Tennessee Natural Heritage Program	TVA is coordinating with TDEC and USACE on the surface water resources identified on the project site and will evaluate potential impacts to these in the EIS. TVA and SR Tullahoma would establish and maintain minimization buffers around water resources, per TVA's standard BMPs for protection of water resources. Impacts to resources deemed jurisdictional to TDEC and USACE would be permitted in compliance with the Clean Water Act Sections 401 and 404.

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
15	NOI	Agency Coordination; Biological Resources	Recommendations that a thorough field inventory of rare species be conducted for the study area in order to develop avoidance and minimization measures. Southeastern Grasslands Initiative recommended such a survey be conducted by trained botanists and ecologists knowledgeable about the many rare species and natural communities known from The Barrens of the Eastern Highland Rim. The Tennessee Natural Heritage Program reviewed the state's database with regard to the project boundaries and found six rare plant species and three rare wildlife species that have been observed previously within the project area or within one mile of the project area and eleven rare plant species and three rare wildlife species have been reported within four miles of the project area. Both entities offered to participate in the field inventory. Following the survey and the potential identification of rare species or associated habitat, the commenters offered to provide more specific recommendations such as the portions of the property that could be designated as natural areas. Both commenters recommended that the project coordinate with the Tennessee Wildlife Resources Agency (TWRA), Region 2, to ensure that rare species and natural communities are known for the project area or legal requirements for protection of state listed rare animals are addressed.	Dillon Blankenship, Tennessee Department of Environment and Conservation, Tennessee Natural Heritage Program, and Dwyane Estes, Southeastern Grasslands Initiative	TVA compiled lists of rare plants and animals from the Tennessee Department of Environment and Conservation (TDEC), as well as from the US Fish and Wildlife Service and TVA's Regional Natural Heritage Database, for the project area. TVA acknowledges the offer of assistance in the surveys and assures TDEC and the Southeastern Grasslands Initiative that the surveys are being conducted with the knowledge of potential protected species, per the compiled rare species lists. TVA is investigating the project site for suitability or presence of these species, and the field results and an analysis of impacts to the species and habitat will be provided in the EIS. TVA will provide notice to TDEC, TWRA, and other commenters and potentially interested state and federal agencies when the Draft EIS is issued for public review and comment.

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From: Wufoo
To: nepa
Subject: NEPA Comments - Moore County Solar [#1]
Date: Friday, May 07, 2021 8:21:54 AM

This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.

Name	Lakshya Bharadwaj
City	Orono
State	Maine
Email	[redacted]
Phone Number	[redacted]

Please provide your comments by uploading a file or by entering them below. *

Hello,

I understand that the point of this section is to discuss suggestions and concerns regarding the scope and components of the environmental impact study, and I will try to concisely do the same. This particular purchase of solar energy is a direct action indicating demand and support for the expansion of solar energy in the USA. Consequently, this procurement of energy will have an influence on energy policy in some manner, major or minor. For this reason, I appreciate the idea of a thorough environmental assessment.

These components may already be part of the study, but if they are not, I would like to point out how crucial it can be to account for the role solar energy plays in generating renewable energy jobs. At about 2200 jobs per TWh, solar energy creates many more jobs per unit of electricity generation than, for example, the oil industry does at about 1000 jobs per TWh. Moving forward, we need economically viable sources of renewable energy, and this statistic helps the cause greatly.

When it comes to emissions, solar energy is responsible for an emissions amount that is 95% less than that associated with the use of fossil fuels. Another environmental factor to keep in mind is the zero water requirement solar energy (Photo Voltaic) production has. The decision to purchase solar energy can also pave the way for community awareness and the involvement of community solar farms that are known to reduce electricity bills by 10% – 15%.

Thank you for your time, and best wishes for this project!

Sincerely,
Lakshya Bharadwaj

From: Kopec, Brett A <bkopec@usgs.gov>
Sent: Tuesday, May 11, 2021 8:35 AM
To: nepa
Cc: Janowicz, Jon A
Subject: Fw: ENVIRONMENTAL REVIEW (ER) NEW POSTING NOTIFICATION: ER21/0166 - NOI TVA to Prepare an EIS for the purchase of electricity generated by the proposed Moore County Solar Project, Moore County, Tennessee

This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.

Brett Kopec
USGS
Administrative Operations Assistant

From: Gordon, Alison D <agordon@usgs.gov>
Sent: Monday, May 10, 2021 1:53 PM
To: Kopec, Brett A <bkopec@usgs.gov>
Cc: Janowicz, Jon A <jjanowicz@usgs.gov>
Subject: Fw: ENVIRONMENTAL REVIEW (ER) NEW POSTING NOTIFICATION: ER21/0166 - NOI TVA to Prepare an EIS for the purchase of electricity generated by the proposed Moore County Solar Project, Moore County, Tennessee
The USGS has no comment at this time. Thank you.

From: oepchq@ios.doi.gov <oepchq@ios.doi.gov>
Sent: Monday, May 3, 2021 7:39 AM
To: Reddick, Virginia <Virginia_Reddick@ios.doi.gov>; Treichel, Lisa C <Lisa_Treichel@ios.doi.gov>; Alam, Shawn K <Shawn_Alam@ios.doi.gov>; Braegelmann, Carol <carol_braegelmann@ios.doi.gov>; Kelly, Cheryl L <cheryl_kelly@ios.doi.gov>; ERs, FWS HQ <FWS_HQ_ERs@fws.gov>; Runkel, Roxanne <Roxanne_Runkel@nps.gov>; Stedeford, Melissa <Melissa_Stedeford@nps.gov>; Hamlett, Stephanie R <shamlett@osmre.gov>; Janowicz, Jon A <jjanowicz@usgs.gov>; Gordon, Alison D <agordon@usgs.gov>; oepchq@ios.doi.gov <oepchq@ios.doi.gov>; Stanley, Joyce A <Joyce_Stanley@ios.doi.gov>
Subject: ENVIRONMENTAL REVIEW (ER) NEW POSTING NOTIFICATION: ER21/0166 - NOI TVA to Prepare an EIS for the purchase of electricity generated by the proposed Moore County Solar Project, Moore County, Tennessee
This e-mail alerts you to a Environmental Review (ER) request from the Office of Environmental Policy and Compliance (OEPC). This ER can be accessed here.
To access electronic ERs visit the Environmental Assignments website: https://ecl.doi.gov/ERs.cfm. For assistance, please contact the Environmental Review Team at 202-208-5464.
Comments due to Agency by: 06/04/21

From: [redacted]
Sent: Tuesday, May 11, 2021 9:40 AM
To: nepa
Subject: Comment from Moore County, Tennessee concerning solar power.

This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.

My comment is solar energy is a possible. Plus in certain areas in our daily .Life, but it could be devastating in other areas of our daily life. I keep remembrng those people in Texas that almost froze to death this past winter.

I believe God has taken care of us all these years but we do need to watch what we allow to enter our atmosphere .

Think I we would be better to repair an reinforce the infrastructures we have. Now

Thank you
Brenda

Sent via the Samsung Galaxy Tab E, an AT&T 4G LTE tablet

From: White, Douglas
To: nepa
Cc: Kajumba, Ntale; Somerville, Amanetta
Subject: TVA NOI Moore County Solar NEPA EPA Comments
Date: Friday, May 28, 2021 12:47:43 PM

This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.

Good afternoon Ms. Pilakowski,

Re: Notice of Intent for the Tennessee Valley Authority Preparation of an Environmental Impact Statement or Environmental Assessment for the Purchase of Electricity Generated by the Proposed Moore County Solar Project in Moore County, Tennessee.

The U. S. Environmental Protection Agency (EPA) is in receipt of the referenced document and has reviewed the subject proposal in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The EPA understands that the Tennessee Valley Authority (TVA) is conducting a NEPA analysis for the proposed construction, operation, and maintenance of a 200-megawatt solar facility in Moore County, Tennessee. The proposed project will occupy 2,000 acres of a predominantly forested 3,300-acre study area bordering Tullahoma. The proposed actions will increase solar power generation as recommended by TVA's 2019 Integrated Resource Plan (IRP) and in response to customer demand for renewable energy.

The EPA recognizes that the proposed solar project has the potential to provide a net benefit to human health and the environment. Based on our review of the scoping document, the EPA has the following comments:

Alternatives: The EPA appreciates the TVA efforts towards developing and analyzing an appropriate amount of alternative project proposals. The EPA recommends including details of considered alternatives within the NEPA documents. Please consider using the NEPAssist tool (https://www.epa.gov/nepa/nepassist), in addition to localized data sources and tools, when conducting the NEPA analysis. NEPAssist combines multiple Geographic Information System (GIS) and internet databases to help screen for environmental concerns.

Wetlands and Streams: This proposed action is situated in a predominantly forested area home to interspersed creeks and wetlands. The EPA recommends that design proposals and construction avoid impacting these Waters of the United States (WOTUS) to the maximum extent practicable by locating permanent proposed infrastructure and temporary construction measures away from WOTUS and respective buffers. WOTUS should be delineated and coordination with the US Army Corps of Engineers (USACE) should be made where proposed activities might enter or affect WOTUS. Flood water mapping should occur to ensure proposed activities do not take place in floodplains except where alternatives are not practicable.

Stormwater - The proposed action has the potential to disturb a considerable amount of soil and a state or county construction stormwater permit will likely be required before construction can begin. Construction stormwater runoff may impact surface water bodies and best management practices should be applied to protect these water bodies before and after construction.

Air Quality and Climate Change: Solar energy has the potential to preserve regional air quality when used to meet growing energy needs and contributes to improved air quality when replacing existing fossil fuel energy sources. The EPA recommends that net greenhouse gas emissions related to this proposal and TVA's 2019 IRP be considered in the NEPA analysis;

While efforts to limit climate change may not lessen the significance of directly or indirectly unrelated impacts, their growing necessity has the potential to provide the substance of decision-making where comparisons of proposals and resulting impacts must be made. Additionally, this project site is within an attainment area for air quality standards, however localized impacts to air quality could occur during construction due to equipment exhaust emissions and fugitive dust. The EPA recommends implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with newer cleaner engines, replacing older vehicles, and reducing idling through operator training and/or contracting policies. We also encourage controlling fugitive dust by watering or the application of other controlled materials.

Environmental Justice: Consistent with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actionsaddress-environmental-justice), please ensure protected populations are not disproportionately or adversely impacted by the project. We also promote compliance with Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, if applicable. Please use the EJSCREEN tool (https://www.epa.gov/ejscreen) as part of the NEPA analysis process. EJSCREEN combines environmental and demographic data to help determine environmental justice concerns that are integral to the NEPA process.

Energy and Land Use: The EPA commends the TVA for pursuing solar energy sources to meet the electricity needs of the Tennessee Valley region. This proposed action provides the TVA an opportunity to study land use efficiency of solar energy development in the Tennessee Valley region. Local climate, ecosystems, and agriculture affect the net benefit of photovoltaic solar infrastructure regarding carbon release and sequestration. The EPA recommends consideration of dual land use where land use efficiency can be increased (https://www.energy.gov/eere/solar/farmers-guide-going-solar).

Thank you for the opportunity to provide comments on the TVA's proposed project in Moore County Tennessee. If you have any questions, feel free to contact me via the information provided below.

V/R Douglas White
U.S. Environmental Protection Agency / Region 4
Strategic Programs Office, NEPA Section
61 Forsyth Street, SW
Atlanta, GA 30303-8960
Office: 404-562-8586
white.douglas@epa.gov

STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Natural Areas
Natural Heritage Program
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 2nd Floor
Nashville, Tennessee 37243
Phone 615/532-0431 Fax 615/532-0046

June 3, 2021

Ashley Pilakowski
TVA
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

Subject: Moore County Solar Project
(35.35659, -86.27623)
Moore County, TN
Rare Species Database Review

Dear Ms. Pilakowski:

Thank you for allowing us to comment on the Moore County Solar Project proposed by TVA.

Per your description in the Notice of Intent:

> *TVA has entered into a PPA with Silicon Ranch Corporation to purchase 200 MW AC of power generated by the proposed Moore County Solar Project, hereafter referred to as the project. The proposed 200 MW AC solar facility would occupy approximately 2,000 acres of the roughly 3,300-acre Project Study Area which is located entirely in Moore County, Tennessee. The project site is bisected by State Route 55 and its eastern boundary borders the western city limits of Tullahoma, Tennessee. The project site is mostly forested with areas of wetlands, croplands, and early successional fields. A TVA 161-kilovolt transmission line runs north-south through the site*

We have reviewed the state's natural heritage database with regard to the project boundaries, and we find that the following rare species have been observed previously within the project area or within one mile of the project area:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	*Dichanthelium acuminatum ssp. leucothrix*	Roughish Witchgrass	G4?Q	S1	--	S	Moist Pine Barrens
Vascular Plant	*Dichanthelium ensifolium ssp. curtifolium*	Short-leaved Panic Grass	G4T3?	S1	--	E	Boggy Areas

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	*Drosera brevifolia*	Dwarf Sundew	G5	S2	--	T	Wet Barrens and Ecotones
Vascular Plant	*Platanthera cristata*	Yellow Crested Orchid	G5	S2S3	--	S	Acidic Seeps and Stream Heads
Vascular Plant	*Stenanthium tennesseense*	Death-camas	G2	S2	--	T	Acidic Wetlands
International Vegetation Classification - Natural	*Quercus phellos - Quercus alba / Vaccinium fuscatum - (Viburnum nudum) / Carex barrattii Wet Forest*	Barrens Depression Willow Oak Forest	G2	SNR	--	Rare, Not State Listed	
Vertebrate Animal	*Fundulus julisia*	Barrens Topminnow	G1	S1	LE	E	Springs, spring runs, and first- and second-order headwaters and creeks in the Barrens of Cannon, Coffee, & Warren counties.
Vertebrate Animal	*Hemitremia flammea*	Flame Chub	G3	S3	--	D	Springs and spring-fed streams with lush aquatic vegetation; Tennessee & middle Cumberland river watersheds.
Vertebrate Animal	*Myotis grisescens*	Gray Myotis	G4	S2	LE	E	Cave obligate year-round; frequents forested areas; migratory.

Within four miles of the project area the following additional rare species have been reported:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	Eleocharis wolfii	Wolf Spike-rush	G3G5	S1	--	E	Wet Woods on Floodplains

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	Gaylussacia dumosa	Dwarf Huckleberry	G5	S3	--	T	Barrens
Vascular Plant	Gymnopogon brevifolius	Broad-leaved Beardgrass	G5	S1S2	--	S	Barrens
Vascular Plant	Helianthemum propinquum	Low Frostweed	G4	S1S2	--	E	Barrens
Vascular Plant	Helianthus eggertii	Eggert's Sunflower	G3	S3	DM	S	Barrens and Roadsides
Vascular Plant	Iris prismatica	Slender Blue Flag	G4G5	S2S3	--	T	Wet Barrens
Vascular Plant	Lespedeza angustifolia	Narrowleaf Bushclover	G5	S2	--	T	Barrens
Vascular Plant	Prenanthes aspera	Rough Rattlesnake-root	G4?	S1	--	E	Barrens and Roadsides
Vascular Plant	Prunus pumila	Sand Cherry	G5	S1	--	E	Barrens
Vascular Plant	Rhynchospora perplexa	Obscure Beak-rush	G5	S2	--	T	Marshes, Wet Barrens
Vascular Plant	Silene ovata	Ovate Catchfly	G3	S2	--	E	Open Oak Woods
Invertebrate Animal	Hesperochernes mirabilis	Southeastern Cave Pseudoscorpion	G5	S3	--	Rare, Not State Listed	Terrestrial cave obligate; woodrat debris in caves; middle Tennessee.
Vertebrate Animal	Etheostoma luteovinctum	Redband Darter	G4	S4	--	D	Limestone streams; Nashville Basin & portions of Highland Rim.
Vertebrate Animal	Pituophis melanoleucus melanoleucus	Northern Pinesnake	G4T4	S3	--	T	Well-drained sandy soils in pine/pine-oak woods; dry mountain ridges; E portions of west TN, E to lower elev of the Appalachians.

The Division of Natural Areas - Natural Heritage Program has reviewed the location of the proposed project workspace with respect to rare plant species. Based on the habitat within the project area and the type of project, we anticipate potential impacts to occurrences of rare, threatened, or endangered plant species from this project.

This portion of Moore County is more similar to Coffee County and its suite of natural communities and species than to the rest of Moore County. The site could contain as many rare species as ecologically rich areas of the Eastern Highland Rim Barrens nearby in Coffee County. Extensive rare species surveys would be needed to ensure minimal impact; the known rare plants will likely be wet woodland or open wetland and barrens species. Following surveys, it may be possible for locations with rare species or significant natural communities to be avoided in development plans and possibly enhanced with suitable habitat management. As such, some portions of the property could be appropriate for non-binding natural area registry agreements or even designation, if appropriate.

Moreover, soil maps indicating the presence of hydric soils at the site suggest that coordination with TDEC and possibly USACE will be required for stream and wetland protection. The Division requests further correspondence from the requesting party as rare species surveys are undertaken and project plans are developed for the site. The Division may be available to provide technical assistance in conducting surveys for rare species and natural communities within the Eastern Highland Rim Barrens region. The Division of Natural Areas considers this property of high conservation value due to the multiple listed rare species and rare wetlands on the site. The Division will support long term conservation efforts for this valuable resource.

We ask that you also coordinate this project with the Tennessee Wildlife Resources Agency (Region 2, Mike Murdock, 615-781-6581, mike.murdock@tn.gov) to ensure that legal requirements for protection of state listed rare animals are addressed. Additionally, we ask that you contact the U.S. Fish and Wildlife Service Field Office, Cookeville, Tennessee (931-525-4970) for comments regarding federally listed species

Thank you for considering Tennessee's rare species throughout the planning of this project. Should you have any questions, please do not hesitate to contact me at 615-532-4799 or dillon.blankenship@tn.gov.

Sincerely,

Dillon

Dillon Blankenship | Environmental Review Coordinator
Tennessee Natural Heritage Program

SOUTHEASTERN GRASSLANDS INITIATIVE

Ashley Pilakowski
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

June 4, 2021

Re: Moore County, TN Solar Project site

Ms. Pilakowski:

We're writing to express our interest in and concern regarding a tract of land under consideration for conversion to a solar energy production facility (the Moore County Solar Project). In short, we believe portions of the tract have exceptional potential for protection and management as a regionally-important natural area, especially for the restoration of oak savanna grasslands and associated wetlands. We envision win-win opportunities for solar production, rare species conservation, ecological restoration, and public education and outreach.

This particular area is known to support high-quality examples of globally rare flatwoods and wet grassland (in the powerline rights-of-way) natural communities that support several species of state and global conservation concern. As far as we are aware, only limited ecological and biological inventory work has been done on the site but several wet grassland species on the *Tennessee Rare Plant List* have been documented including Short-leaved Panic Grass (*Dichanthelium ensifolium* subsp. *curtifolium*), Button Sedge (*Carex bullata*), Dwarf Sundew (*Drosera brevifolia*), Yellow Crested Orchid (*Platanthera cristata*), and Tennessee Featherbells (*Stenanthium tennessense*). This latter species was described new-to-science in 2017, by one of SGI's team members (Dr. Alan Weakley), and is extremely rare globally, with a conservation status rank of G2S2 (Globally Imperiled). This savanna endemic wildflower is known to survive in just a handful of populations in four counties in central Tennessee and nowhere else in the world. Protecting and properly managing populations of Tennessee Featherbells is among the highest conservation priorities in the state and region. In addition, it is highly likely that other savanna and open wetland species of state and global concern occur on the property and will be found with additional inventory. We recommend that you check with the Tennessee Natural Heritage Program and Tennessee Wildlife Resources Agency to determine if other rare species and natural communities are known from the site or immediate area.

Prior to Euro-American settlement and the disruption of naturally occurring landscape-scale fires (which burned historically every 1-5 years based on recent tree-ring research), this area of the Eastern Highland Rim of Tennessee, known as "The Barrens," was a mosaic of grasslands (oak savannas, prairies, marshes), open grassy flatwoods, and forested wetlands. During the past century-and-a-half these savanna grasslands and other open communities have become unnaturally densely forested (as they are today) due to prolonged fire suppression. The more open of these communities – the grasslands and grassland-related woodlands – supported extraordinarily high concentrations of plant and animal species, many of which have declined dramatically and are today listed as species of conservation concern (rare species) by the State of Tennessee. Remaining intact examples (including open road and utility rights-of-way through otherwise "closed in" savannas and woodlands) are known to support many of these species of concern. Nearby examples include May Prairie State Natural Area, Powerline Barrens State Natural Area, and a number of other sites on Arnold Air Force Base. Many sites that have been degraded by becoming "closed in" may still contain enough

SOUTHEASTERN GRASSLANDS INITIATIVE

remnant grassland species to be considered restorable. Additionally, powerline and roadside rights-of-way on the tract contain remnants of the grassland flora, including these rare species. These corridors along with their nearby woodlands are also high priority sites for conservation.

These fire-suppressed flatwoods are seasonally wet and often contain embedded permanent wetlands. Analysis of aerial imagery shows the presence of numerous sinkhole depression ponds or other wetlands on the tract. Recent research by a graduate student at Austin Peay State University, who studied dozens of these ponds across the southern Eastern Highland Rim, found that ponds in this region are globally unique wetlands that support numerous rare plant species, including several that occur nowhere else in Tennessee or outside of the "Barrens" area. These ponds, like the nearby flatwoods, have become excessively dense with woody vegetation over the past century. The student found that these ponds have a high number of light-dependent rare wet grassland species and, like the adjacent flatwoods, they are in need of restoration to create more of an open savanna grassland mosaic. It is likely that the ponds on this tract in Moore County harbor some of these rare species and natural communities and would benefit from restoration.

The Southeastern Grasslands Initiative (SGI) works to conserve, restore, and promote native grasslands of all types throughout the southeastern United States. We work with a wide variety of partners (including the Tennessee Valley Authority) to identify, protect, restore, and manage sensitive ecological sites such as this one. We are presently working on a project with the TVA studying remnant grassland plant communities in transmission powerline rights-of-way in the adjacent Cumberland Plateau Ecoregion. We recommend a thorough inventory of the site by trained botanists and ecologists knowledgeable about the many rare species and natural communities known from The Barrens of the Eastern Highland Rim. This work is essential prior to development so that the most ecologically sensitive areas can be considered in the planning of the site. We would be happy to participate in such inventory and offer further, more specific recommendations regarding areas deserving protection, restoration, and management.

In summary, there are "win-win" opportunities for this project. While solar production is likely suitable for some sections of the property, for those areas that are the most ecologically sensitive, we see the potential for coupling preservation of rare species, ecological restoration, and public education and outreach. Restoration of the grassland components of The Barrens has been a high priority for our organization since its inception. For the past several months, we have been having conversations with leaders in education, business, and municipal government in Moore County about how to escalate grassland conservation efforts in The Barrens. We see opportunities here to accomplish something very special through collaboration.

Thank you for the opportunity to comment.

Dwayne Estes Ph.D., Executive Director

Theo Witsell, Chief Ecologist

Southeastern Grasslands Initiative | Center of Excellence for Field Biology | Austin Peay State University | Clarksville, TN 37044 | 931-221-7771 | www.segrasslands.org |

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INVITATION FOR PUBLIC COMMENT (Ad to post on or after 4/22/2022)

Moore County Solar Project

The Tennessee Valley Authority (TVA) is asking the public to provide input on a Draft Environmental Impact Statement (EIS) for the Moore County Solar project in Moore County, Tennessee. Details of the review are available at www.tva.com/nepa.

TVA has entered into a power purchase agreement (PPA) with SR Tullahoma, LLC, a wholly owned subsidiary of Silicon Ranch Corporation, to purchase the power generated by the proposed Moore County Solar Project in Moore County, TN, contingent on completion of environmental reviews. The Project is anticipated to generate up to 200 megawatts (MW) alternating current (AC) output. The proposed solar facility would be constructed and operated by SR Tullahoma, LLC.

The purpose of the Moore County Solar project Draft EIS is to address the potential environmental effects associated with constructing, operating, maintaining and decommissioning the solar photovoltaic (PV) facility versus taking no action. The Draft EIS includes two alternatives: a No Action Alternative and an Action Alternative.

Under the No Action Alternative, TVA would not implement the PPA to purchase the power generated by Moore County Solar, and SR Tullahoma would not develop a solar PV facility at this location. Under the Action Alternative, SR Tullahoma would construct, operate, maintain, and eventually decommission Moore County Solar on an approximately 3,463-acre Project Site. The Project would connect to TVA's existing adjacent Franklin–Wartrace No. 2 161-kV transmission line and would include the building of an on-site 161-kV substation and switchyard. The entire 200-MW output from the Solar Facility would be sold to TVA under the terms of the PPA.

The complete Draft EIS document is available online at https://www.tva.com/NEPA.

Virtual Public Open House

TVA plans to host a virtual public open house on May 23, 2022, from 6:00 p.m. – 7:30 p.m. CT. Please register to attend at https://adobe.ly/3uSYios and receive the link to join the event from your computer or device.

Submitting Comments

TVA invites you to comment on the draft EIS. Comments must be received or postmarked no later than **June 6, 2022**. Electronic comment submittals are preferred. Any comments received, including names and addresses, will become part of the administrative record and will be available for public inspection.

Written comments should be sent to:
Tennessee Valley Authority
ATTN: Ashley Pilakowski, NEPA Specialist
400 West Summit Hill Drive, WT-11B, Knoxville, TN 37902

Email Comments Here: nepa@tva.gov

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TVA

TVA MEDIA ADVISORY

TVA Seeks Public Input on Moore County Solar Project

TULLAHOMA, Tenn. – The Tennessee Valley Authority values public input and is launching a process to gather feedback on the Draft Environmental Impact Statement (EIS) for a proposed 200-megawatt solar farm in Moore County. This project underscores the agency's efforts to create a clean, carbon-free energy future.

The Moore County Solar Project EIS is available for a 45-day public review and comment period at https://www.tva.com/nepa. In addition, TVA will hold a virtual open house on Monday, May 23, 2022, beginning at 6 p.m. CST. TVA staff will be available virtually to answer questions and discuss a variety of topics related to project. Register here.

To promote job creation across the region and achieve its plans to add 10,000 megawatts of solar by 2035, TVA has entered into a power purchase agreement with SR Tullahoma, a wholly owned subsidiary of Silicon Ranch Corporation, to buy the power generated by the proposed solar farm, contingent on completion of environmental reviews. SR Tullahoma would construct and operate the proposed facility.

The EIS includes two alternatives: a No Action Alternative and an Action Alternative. Under the No Action Alternative, TVA would not implement the PPA to purchase the power generated by Moore County Solar, and SR Tullahoma would not develop a solar facility. Under the Action Alternative, SR Tullahoma would construct, operate, maintain, and eventually decommission Moore County Solar on an approximately 3,463-acre Project Site. TVA would use an existing powerline and build a new substation on the site to connect the facility to the electric grid.

The public comment period begins today and ends on June 6, 2022. Comments can be submitted online at www.tva.com/nepa, by email to nepa@tva.gov, and by mail in writing to Tennessee Valley Authority, ATTN: Ashley Pilakowski, NEPA Specialist, 400 W Summit Hill Dr., WT 11-B, Knoxville, TN 37902.

All comments received, including names and addresses, will become part of the administrative record and available for public inspection.

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For more information about TVA and its 88-year mission of service to the Tennessee Valley, click here.

Media Contact: Scott Fiedler, Chattanooga, 901-414-6964
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www.tva.com/news

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(Anticipated Distribution Date: April 22, 2022)

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