STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
REGION 3 PROJECT DEVELOPMENT
ENVIRONMENTAL TECH GROUP
6601 CENTENNIAL BOULEVARD
NASHVILLE, TENNESSEE 37243-0360
(615) 350-4250

JOSEPH GALBATO, III
INTERIM COMMISSIONER

BILL LEE
GOVERNOR

MEMORANDUM

To: Sharon Schutz
Region 3 Project Development

From: Madalyn Brown
Region 3 Environmental Tech Group

Madalyn Brown

Date: December 20, 2021

Subject: ENVIRONMENTAL BOUNDARIES FOR:
Davidson County, SR-11 (US-31W, North Main Street), From Fannin Drive to Old Stone Bridge Road, including the CSX R/R Overpass Structure
PIN: 124781.00 PE: 19031-1217-14

An ecological evaluation of the subject project has been conducted with the following results:

STREAMS: There are six streams and four ephemeral streams (WWC/EPH) within the project area. STR-2, Manskers Creek, has been assessed and is not supporting due to siltation and E. coli. STR-5, Lumsley Fork, has been assessed and is not supporting due to E. coli.

WETLANDS: There are three wetlands within the project area. WTL-1 did not require a TRAM score because it falls under the first category on the TRAM Guidance Red Flag Section: Wetland is a "roadside ditch" and not part of a larger wetland – constructed primarily to convey runoff. WTL-2 and WTL-3 are low resource value.

OTHER FEATURES: There is one wet weather conveyance (WWC/UDF) within the project area.

SPECIES: A species search of the Natural Heritage Inventory Program's rare species database was done on August 23, 2021. Correspondence from USFWS, TWRA, and TDEC DNA is included with this report.

SPECIAL NOTES: There are no special notes for the subject project.

COMMITMENTS: The following is a commitment and will be added in PPRM:

> Due to the presence of the state endangered Streamside Salamander (*Ambystoma barbouri*), a sweep shall be conducted immediately prior to any construction. Any surveys prior to construction must be conducted from December 15th to March 15th. The contractor shall contact the Region 3 Environmental Tech Group, at least 14 days prior to construction to coordinate the sweep: 615-335-8783, R3.EnvTechOffice@tn.gov, 6601 Centennial Blvd Bldg A 2nd Flr Nashville, TN 37243.

Due to the presence of the state endangered Streamside Salamander (*Ambystoma barbouri*), construction is prohibited from December 15th through June 1st to minimize impacts during breeding season and development of embryos.

If the scope of work for this project is revised, please contact the Regional biologist for additional review and agency coordination as soon as possible. Your assistance is appreciated. If you have any questions or comments, please contact me at (615) 350-4209 or madalyn.brown@tn.gov.

xc: Aso Hawrami
Anthony Myers
Wesley Peck
Melissa Portell
R3.EnvTechOffice
TDOT.Env.Ecology
TDOT.Env.Permits
TDOT.Env.Mitigation
TDOT.Env NEPA

Natural Resources Impact Table
Davidson County, SR-11 (US-31W, North Main Street), From Fannin Drive to Old Stone Bridge Road, including the CSX R/R Overpass Structure
PIN: 124781.00 PE: 19031-1217-14

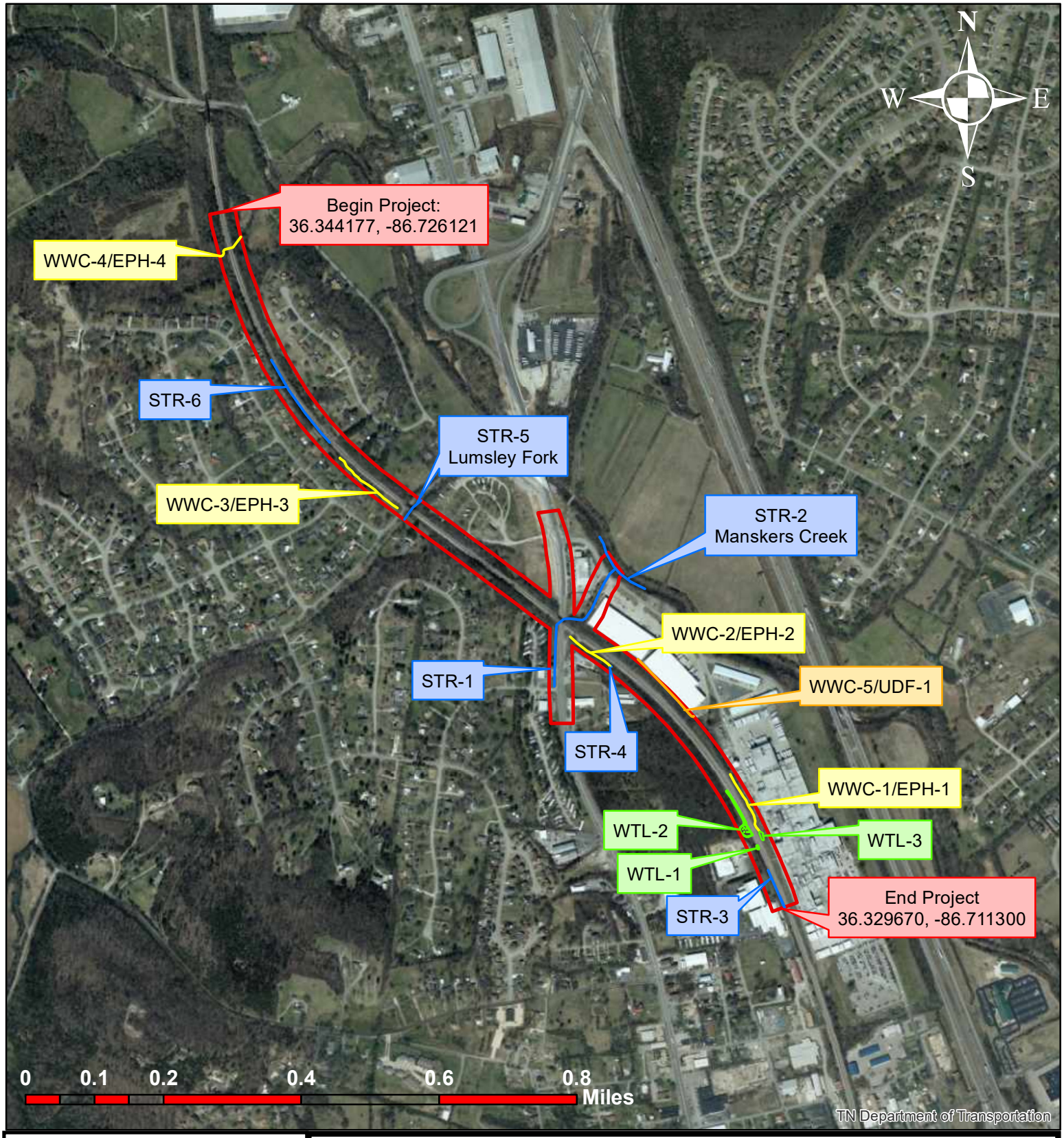
Labels	Type *	Function	Quality	Impacts **		
				Permanent	Temporary	Total
Wetlands						
WTL-1	Slope	Groundwater discharge	Low	0.0 ac	0.01 ac	0.01 ac
WTL-2	Slope	Stormwater filtration	Low	0.0 ac	0.21 ac	0.21 ac
WTL-3	Slope	Stormwater filtration	Low	0.0 ac	0.04 ac	0.04 ac
					Total	0.26 ac

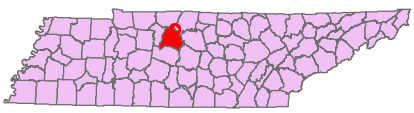
Labels	Type *	Function	Quality	Impacts **		
				Permanent	Temporary	Total
Streams						
STR-1	Perennial		Not Assessed	560 ft	0 ft	560 ft
STR-2 Manskers Creek	Perennial		Not Supporting	0 ft	0 ft	0 ft
STR-3	Perennial		Not Assessed	0 ft	0 ft	0 ft
STR-4	Perennial		Not Assessed	0 ft	0 ft	0 ft
STR-5 Lumsley Fork	Perennial		Not Supporting	145 ft	0 ft	145 ft
STR-6	Perennial		Not Assessed	0 ft	0 ft	0 ft
WWC-1/EPH-1	Ephemeral		N/A	0 ft	0 ft	0 ft
WWC-2/EPH-2	Ephemeral		N/A	0 ft	0 ft	0 ft
WWC-3/EPH-3	Ephemeral		N/A	0 ft	0 ft	0 ft
WWC-4/EPH-4	Ephemeral		N/A	0 ft	0 ft	0 ft
					Total	705 ft

Labels	Type *	Function	Quality	Impacts **		
				Permanent	Temporary	Total
Wet Weather Conveyances						
WWC-5/UDF-1	Wet Weather Conveyance			0 ft	0 ft	0 ft
					Total	0 ft

* Identification of features has not been reviewed by regulatory agencies and determinations of stream type could possibly be changed.

** Estimated impacts are considered “Preliminary”. Impact determination will not be completely accurate and impact type is unknown until the time of Permit Application.



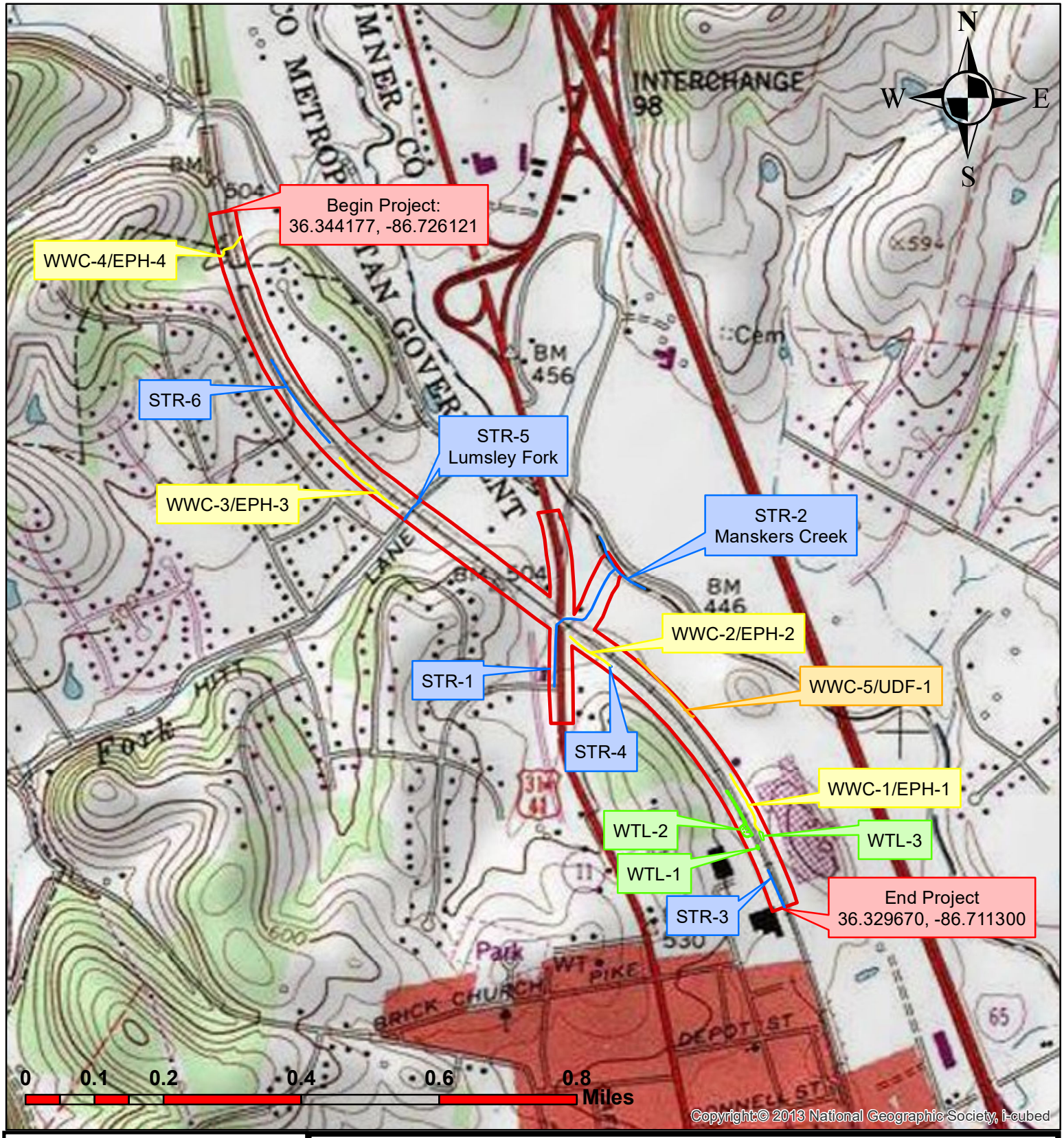


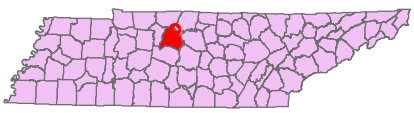
Davidson County, SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including the CSX R/R Overpass Structure

PIN: 124781.00

PE: 19031-1217-14

TN TDOT Department of Transportation





Davidson County, SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including the CSX R/R Overpass Structure

PIN: 124781.00

PE: 19031-1217-14

TN TDOT Department of Transportation

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB	**Affiliation:**	TDOT	**Date:**	11/08/2021

1-Station: from plans									
2-Map label and name	WWC-4/EPH-4								
3-Latitude/Longitude	36.343266, -86.726097								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑					
-HD score (if applicable)	15.25								
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	3 ft	-top of bank width	15 ft						
-width at ordinary high water mark	6 inches from bottom, 4 ft wide								
-bank height	LDB - 10 ft	RDB - 8 ft							
-riffle/pool complex or other specialized habitat present?	no								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: oak, Chinese privet								
	RDB: oak, Chinese privet								
-date of PJD request									
5-photo numbers	19 & 20								
6-HUC -8 Code & Name	05130202, Cheatham Lake								
7-Assessed	yes	☐	no	☑					
8-ETW	yes	☐	no	☑					
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐	
	no	☑							
10-Notes									
Substrate	fine sediment								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: UT to Manskers Creek	Date/Time: 11/08/2021
Assessors/Affiliation: MLB -TDOT	Project ID : 124781.00
Site Name/Description: WWC-4/EPH-4	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 0 inches	36.343266, -86.726097
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Mimosa silt loam	Source: NRCS
Surrounding Land Use : Forested and railroad	
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	✓	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 = Wet Weather Conveyance / Ephemeral Stream

Secondary Indicator Score (if applicable) = 15.25

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 8.25)		Absent	Weak	Moderate	Strong
1. Continuous bed and bank	3	0	1	2	3
2. Sinuous channel	2	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0	1	2	3
4. Sorting of soil textures or other substrate	0	0	1	2	3
5. Active/relic floodplain	0	0	0.5	1	1.5
6. Depositional bars or benches	1	0	1	2	3
7. Braided channel	0	0	1	2	3
8. Recent alluvial deposits	0	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	0	0	1	2	3
11. Grade controls	0.75	0	0.5	1	1.5
12. Natural valley or drainageway	1.5	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	No = 0		Yes = 3	

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

C. **Biology** (Subtotal = 5)		Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	3	2	1	0
21. Rooted plants in the thalweg [1]	2	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0	1	2	3
23. Bivalves/mussels	0	0	1	2	3
24. Amphibians	0	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	0	1	2	3
26. Filamentous algae; periphyton	0	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	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 = 15.25

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

Notes :

14. one location of a pool with a seep
16. N/A due to season

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB	**Affiliation:**	TDOT	**Date:**	11/08/2021

1-Station: from plans										
2-Map label and name	STR-6									
3-Latitude/Longitude	36.341077, -86.724781									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)										
-OHWM indicators	bed & banks		deposition		presence of litter / debris		scour		veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg	✓	multiple observed flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturbed or absent	✓	natural line impressed on bank		shelving		wracking	
-channel bottom width	2 ft		-top of bank width		2 ft					
-width at ordinary high water mark	2 ft, 4 in from bottom									
-bank height	LDB - 4 in				RDB - 4 in					
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: none									
	RDB: grasses									
-date of PJD request										
5-photo numbers	11 & 12									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										
Substrate	railroad ballast									

Revised June 2019

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 11/08/2021
Assessors/Affiliation: MLB -TDOT	Project ID : 124781.00
Site Name/Description: STR-6	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 0 inches	36.341077, -86.724781
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Armour silt loam, Mimosa silt loam	Source: NRCS
Surrounding Land Use : low density residential, railroad	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB	**Affiliation:**	TDOT	**Date:**	11/08/2021

1-Station: from plans									
2-Map label and name	WWC-3/EPH-3								
3-Latitude/Longitude	36.338572, -86.722420								
4-Feature description:									
-channel identification	perennial stream ☐		intermittent stream ☐		ephemeral stream ☑		wwc ☑		
-HD score (if applicable)	6								
-OHWM indicators	bed & banks ☑		deposition ☐		presence of litter / debris ☑		scour ☐		veg absent, bent, matted ☐
	change in plant community ☐		destruction of terrestrial veg ☐		multiple observed flow events ☐		sediment sorting ☐		water staining ☐
	change in soil character ☐		leaf litter disturbed or absent ☐		natural line impressed on bank ☐		shelving ☐		wracking ☑
-channel bottom width	1 ft		-top of bank width		8 ft				
-width at ordinary high water mark	6 inches from bottom, 1.5 ft wide								
-bank height	LDB - 3 ft				RDB - 3 ft				
-riffle/pool complex or other specialized habitat present?	no								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: silver maple, American elm, hackberry								
	RDB: silver maple, hackberry								
-date of PJD request									
5-photo numbers	17 & 18								
6-HUC -8 Code & Name	05130202, Cheatham Lake								
7-Assessed	yes	☐	no	☑					
8-ETW	yes	☐	no	☑					
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐	
	no	☑							
10-Notes									
Substrate	fine sediment								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 11/08/2021
Assessors/Affiliation: MLB -TDOT	Project ID : 124781.00
Site Name/Description: WWC-3/EPH-3	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 0 inches	36.338572, -86.722420
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Armour silt loam and Arrington silt loam	Source: NRCS
Surrounding Land Use : low density residential	
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	✓	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 = Wet Weather Conveyance / Ephemeral

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	2	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0	1	2	3
4. Sorting of soil textures or other substrate	0	0	1	2	3
5. Active/relic floodplain	0	0	0.5	1	1.5
6. Depositional bars or benches	0	0	1	2	3
7. Braided channel	0	0	1	2	3
8. Recent alluvial deposits	0	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	1	0	1	2	3
11. Grade controls	0	0	0.5	1	1.5
12. Natural valley or drainageway	0.5	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	No = 0		Yes = 3	

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

C. Biology (Subtotal = 1)		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	0.5	3	2	1	0
21. Rooted plants in the thalweg [1]	0.5	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0	1	2	3
23. Bivalves/mussels	0	0	1	2	3
24. Amphibians	0	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	0	1	2	3
26. Filamentous algae; periphyton	0	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	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 = 6

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

Notes :

16. N/A due to season

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB	**Affiliation:**	TDOT	**Date:**	11/05/2021

1-Station: from plans										
2-Map label and name	STR-5, Lumsley Fork									
3-Latitude/Longitude	36.337945, -86.721128									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)										
-OHWM indicators	bed & banks	✓	deposition		presence of litter / debris	✓	scour		veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg	✓	multiple observed flow events		sediment sorting		water staining	
	change in soil character	✓	leaf litter disturbed or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	12 ft		-top of bank width		15 ft					
-width at ordinary high water mark	10 in from bottom, 12 ft wide									
-bank height	LDB - 3 ft				RDB - 3 ft					
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sugar hackberry									
	RDB: grasses									
-date of PJD request										
5-photo numbers	9 & 10									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes	✓	no							
8-ETW	yes		no	✓						
9-303 (d) List	yes	✓	siltation		habitat:		other:	✓		
	no									
10-Notes	Stream ID: TN05130202220_0100, Lumsley Fork Habitat Impaired/Not Supporting due to E. coli									
Substrate	bedrock									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Lumsley Fork	Date/Time: 11/05/2021
Assessors/Affiliation: MLB -TDOT	Project ID : 124781.00
Site Name/Description: STR-5, Lumsley Fork	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 0.40 inches	36.337945, -86.721128
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : 3.27 square miles	County: Davidson Co.
Soil Type(s) / Geology : Arrington silt loam	Source: NRCS
Surrounding Land Use : low density residential	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

Macroinvertebrates not confirmed

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, SLN	**Affiliation:**	TDOT	**Date:**	08/26/2021

1-Station: from plans										
2-Map label and name	STR-1									
3-Latitude/Longitude	36.335737, -86.716796									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)										
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter / debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg	✓	multiple observed flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturbed or absent	✓	natural line impressed on bank		shelving		wracking	
-channel bottom width	6 ft		-top of bank width		15 ft					
-width at ordinary high water mark	1.5 ft from bottom, 8 ft wide									
-bank height	LDB - 5 ft				RDB - 8 ft					
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: winter creeper, boxelder, Chinese privet, common hackberry, bush honeysuckle									
	RDB: winter creeper, boxelder, Chinese privet, common hackberry, bush honeysuckle									
-date of PJD request										
5-photo numbers	1 & 2									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										
Substrate	fine sediment and sparse bedrock									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: UT to Manskers Creek	Date/Time: 08/26/2021
Assessors/Affiliation: MLB, SLN -TDOT	Project ID : 124781.00
Site Name/Description: STR-1	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.42 inches	36.335737, -86.716796
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : 0.18 square miles	County: Davidson Co.
Soil Type(s) / Geology : Lindell silt loam, Arrington silt loam,	Source: NRCS
Surrounding Land Use : Industrial, residential, and commercial	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

-Heptageniidae and fish observed
-'Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase' not confirmed

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, SLN	**Affiliation:**	TDOT	**Date:**	08/26/2021

1-Station: from plans										
2-Map label and name	STR-2, Manskers Creek									
3-Latitude/Longitude	36.336786, -86.715758									
4-Feature description:										
-channel identification	perennial stream	☑	intermittent stream	☐	ephemeral stream	☐	wwc	☐		
-HD score (if applicable)										
-OHWM indicators	bed & banks	☑	deposition	☑	presence of litter / debris	☐	scour	☐	veg absent, bent, matted	☑
	change in plant community	☑	destruction of terrestrial veg	☐	multiple observed flow events	☐	sediment sorting	☐	water staining	☐
	change in soil character	☐	leaf litter disturbed or absent	☑	natural line impressed on bank	☐	shelving	☐	wracking	☐
-channel bottom width	66 ft		-top of bank width		75 ft					
-width at ordinary high water mark	2 ft from bottom, 67 ft wide									
-bank height	LDB - 15 ft				RDB - 15 ft					
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: mimosa, black walnut, green ash, persimmon									
	RDB: American elm, boxelder, osage orange									
-date of PJD request										
5-photo numbers	3 & 4									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes	☑	no	☐						
8-ETW	yes	☐	no	☑						
9-303 (d) List	yes	☑	siltation	☑	habitat:	☑	other:	☐		
	no	☐								
10-Notes	Waterbody ID: TN05130202220_1000, Manskers Creek Imapried/Not supporting due to siltation and E. coli									
Substrate	bedrock and some fine sediment									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Manskers Creek	Date/Time: 08/26/2021
Assessors/Affiliation: MLB, SLN -TDOT	Project ID : 124781.00
Site Name/Description: STR-2, Manskers Creek	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.42 inches	36.336786, -86.715758
Precipitation this Season vs. Normal : (abnormally wet) elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : 27.72 square miles	County: Davidson Co.
Soil Type(s) / Geology : Arrington silt loam, 0 to 2 percent slopes, occasionally flooded	Source: NRCS
Surrounding Land Use : Industrial, residential, and commercial	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

fish observed
macroinvertebrates not confirmed

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, EWD	**Affiliation:**	TDOT	**Date:**	09/07/2021

1-Station: from plans									
2-Map label and name	WWC-2/EPH-2								
3-Latitude/Longitude	36.335277, -86.716780								
4-Feature description:									
-channel identification	perennial stream ☐		intermittent stream ☐		ephemeral stream ☑		wwc ☑		
-HD score (if applicable)	9.25								
-OHWM indicators	bed & banks ☐		deposition ☐		presence of litter / debris ☑		scour ☐		veg absent, bent, matted ☑
	change in plant community ☐		destruction of terrestrial veg ☑		multiple observed flow events ☐		sediment sorting ☐		water staining ☐
	change in soil character ☐		leaf litter disturbed or absent ☐		natural line impressed on bank ☐		shelving ☐		wracking ☐
-channel bottom width	1.5 ft		-top of bank width		2.5 ft				
-width at ordinary high water mark	2 inches from bottom, 2 ft wide								
-bank height	LDB - 1 ft				RDB - 1 ft				
-riffle/pool complex or other specialized habitat present?	no								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: bush honeysuckle, common hackberry, black willow								
	RDB: bush honeysuckle, common hackberry, black willow								
-date of PJD request									
5-photo numbers	15 & 16								
6-HUC -8 Code & Name	05130202, Cheatham Lake								
7-Assessed	yes	☐	no	☑					
8-ETW	yes	☐	no	☑					
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐	
	no	☑							
10-Notes									
Substrate	fine sediment								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 09/07/2021
Assessors/Affiliation: MLB, EWD -TDOT	Project ID : 124781.00
Site Name/Description: WWC-2/EPH-2	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.36 inches	36.335277, -86.716780
Precipitation this Season vs. Normal : (abnormally wet) elevated average low abnormally dry unknown Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Lindell silt loam, Byler silt loam	Source: NRCS
Surrounding Land Use : Industrial, Commercial, Railroad	
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	✓	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 = Wet Weather Conveyance/Ephemeral Stream

Secondary Indicator Score (if applicable) = 9.25

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 1.75)		Absent	Weak	Moderate	Strong
1. Continuous bed and bank	1	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0	1	2	3
4. Sorting of soil textures or other substrate	0	0	1	2	3
5. Active/relic floodplain	0	0	0.5	1	1.5
6. Depositional bars or benches	0	0	1	2	3
7. Braided channel	0	0	1	2	3
8. Recent alluvial deposits	0	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	0	0	1	2	3
11. Grade controls	0	0	0.5	1	1.5
12. Natural valley or drainageway	0.75	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	No = 0		Yes = 3	

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

C. **Biology** (Subtotal = 6)		Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	3	2	1	0
21. Rooted plants in the thalweg [1]	3	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0	1	2	3
23. Bivalves/mussels	0	0	1	2	3
24. Amphibians	0	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	0	1	2	3
26. Filamentous algae; periphyton	0	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	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 = 9.25

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, EWD	**Affiliation:**	TDOT	**Date:**	09/07/2021

1-Station: from plans										
2-Map label and name	STR-4									
3-Latitude/Longitude	36.334735, -86.715888									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)										
-OHWM indicators	bed & banks		deposition		presence of litter / debris	✓	scour		veg absent, bent, matted	
	change in plant community	✓	destruction of terrestrial veg		multiple observed flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturbed or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	2.5 ft		-top of bank width	3.5 ft						
-width at ordinary high water mark	6 in from bottom, 3 ft wide									
-bank height	LDB - 1ft		RDB - 1ft							
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: cotton wood, bush honeysuckle, hackberry									
	RDB: black willow, bush honeysuckle, hackberry									
-date of PJD request										
5-photo numbers	7 & 8									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										
Substrate	fine sediment									

Revised June 2019

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 09/07/2021
Assessors/Affiliation: MLB, EWD -TDOT	Project ID : 124781.00
Site Name/Description: STR-4	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.36 inches	36.334735, -86.715888
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Byler silt loam	Source: NRCS
Surrounding Land Use : Industrial, Commercial, Railroad	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

-Water is cold while outside temperature is ~72°
-Hydrology travels underground and back out
-Stream is black (organic matter on bottom is black)
-Chlorine test resulted in absence of chlorine

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB	**Affiliation:**	TDOT	**Date:**	11/10/2021

1-Station: from plans									
2-Map label and name	WWC-5/UDF-1								
3-Latitude/Longitude	36.334715, -86.715044								
4-Feature description:									
-channel identification	perennial stream ☐		intermittent stream ☐		ephemeral stream ☐		wwc ☑		
-HD score (if applicable)	4.5								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	4 ft	-top of bank width	7 ft						
-width at ordinary high water mark	4 ft wide, 4 inches from the bottom								
-bank height	LDB - N/A	RDB - N/A							
-riffle/pool complex or other specialized habitat present?	no								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: box elder, black walnut, sycamore								
	RDB: bush honeysuckle, black walnut, sycamore								
-date of PJD request									
5-photo numbers	21 & 22								
6-HUC -8 Code & Name	05130202, Cheatham Lake								
7-Assessed	yes	☐	no	☑					
8-ETW	yes	☐	no	☑					
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐	
	no	☑							
10-Notes	Bank height is not applicable because there is no presence of bed & banks								
Substrate	fine sediment and gravel from fill								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 11/10/2021
Assessors/Affiliation: MLB -TDOT	Project ID : 124781.00
Site Name/Description: WWC-5/UDF-1	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 0 inches	36.334715, -86.715044
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Byler silt loam	Source: NRCS
Surrounding Land Use : Industrial	
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	✓	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 = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4.5

Justification / Notes :

Secondary Field Indicator Evaluation

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

B. **Hydrology** (Subtotal = 2.5)		Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	1	0	1	2	3
15. Water in channel and >48 hours since sig. rain	1	0	1	2	3
16. Leaf litter in channel (January – September)	0	1.5	1	0.5	0
17. Sediment on plants or on debris	0.25	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0.25	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	0	No = 0		Yes = 1.5	

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

14. water standing in pools in one area, hyporheic zone is saturated, when digging water comes up possible high water table. It is not a wetland due to the absence of hydric soils and hydrophytic vegetation.
16. N/A due to season

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, EWD	**Affiliation:**	TDOT	**Date:**	09/07/2021

1-Station: from plans									
2-Map label and name	WWC-1/EPH-1								
3-Latitude/Longitude	36.331985, -86.712422								
4-Feature description:									
-channel identification	perennial stream ☐		intermittent stream ☐		ephemeral stream ☑		wwc ☑		
-HD score (if applicable)	12								
-OHWM indicators	bed & banks ☑		deposition ☐		presence of litter / debris ☐		scour ☑		veg absent, bent, matted ☑
	change in plant community ☑		destruction of terrestrial veg ☐		multiple observed flow events ☐		sediment sorting ☐		water staining ☐
	change in soil character ☐		leaf litter disturbed or absent ☐		natural line impressed on bank ☐		shelving ☐		wracking ☐
-channel bottom width	1.5 ft			-top of bank width		3 ft			
-width at ordinary high water mark	4 inches from bottom, 2 ft wide								
-bank height	LDB - 1 ft				RDB - 1.5 ft				
-riffle/pool complex or other specialized habitat present?	no								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: boxelder, black gum								
	RDB: multiflora rose, boxelder								
-date of PJD request									
5-photo numbers	13 & 14								
6-HUC -8 Code & Name	05130202, Cheatham Lake								
7-Assessed	yes	☐	no	☑					
8-ETW	yes	☐	no	☑					
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐	
	no	☑							
10-Notes									
Substrate	fine sediment, gravel and some cobble								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 09/07/2021
Assessors/Affiliation: MLB, EWD -TDOT	Project ID : 124781.00
Site Name/Description: WWC-1/EPH-1	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.36 inches	36.331985, -86.712422
Precipitation this Season vs. Normal : (abnormally wet) elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Mimosa silt loam	Source: NRCS
Surrounding Land Use : Industrial and railroad	
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	✓	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 = Wet Weather Conveyance/Ephemeral Stream

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	3	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0	1	2	3
4. Sorting of soil textures or other substrate	1	0	1	2	3
5. Active/relic floodplain	0	0	0.5	1	1.5
6. Depositional bars or benches	0	0	1	2	3
7. Braided channel	0	0	1	2	3
8. Recent alluvial deposits	0.5	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	0	0	1	2	3
11. Grade controls	0	0	0.5	1	1.5
12. Natural valley or drainageway	0	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	No = 0		Yes = 3	

B. Hydrology (Subtotal = 2.5)		**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	1	0	1	2	3
15. Water in channel and >48 hours since sig. rain	1	0	1	2	3
16. Leaf litter in channel (January – September)	0	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0.5	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	0	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	2	3	2	1	0
21. Rooted plants in the thalweg [1]	3	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0	1	2	3
23. Bivalves/mussels	0	0	1	2	3
24. Amphibians	0	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	0	1	2	3
26. Filamentous algae; periphyton	0	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	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 = 12

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

Notes :

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11, PIN 124781.00 City/County: Davidson Co. Sampling Date: 09/07/2021
Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-2
Investigator(s): MLB, EWD Section, Township, Range: --
Landform (hillslope, terrace, etc.): Hillslope/escarpment Local relief (concave, convex, none): concave Slope (%): ____
Subregion (LRR or MLRA): LRR N Lat: 36.331302 Long: -86.712430 Datum: WGS-84
Soil Map Unit Name: Mimosa silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Photo #: 25 & 26
Climatic conditions are abnormally wet for this time of year.

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): 4 in
Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): surface

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-2

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica (green ash)	10	Yes	FACW
2. Salix nigra (black willow)	10	Yes	OBL
3.			
4.			
5.			
6.			
	20	= Total Cover	

50% of total cover: 10 20% of total cover: 4

Sapling Stratum (Plot size: 5m)			
1. Fraxinus pennsylvanica (green ash)	80	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	80	= Total Cover	

50% of total cover: 40 20% of total cover: 16

Shrub Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 1.5m)			
1. Ligustrum sinense (Chinese privet)	10	Yes	FACU
2. Campsis radicans (trumpet creeper)	10	Yes	FAC
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: 10m)			
1. Rubus argutus (sawtooth blackberry)	10	Yes	FACU
2. Parthenocissus quinquefolia (Virginia creeper)	5	Yes	FACU
3.			
4.			
5.			
	15	= Total Cover	

50% of total cover: 7.5 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 (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:	0 (A)		0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL Sampling Point: WTL-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR3/2	100					SILO	
5-10	5 YR 4/6	100					SILO	

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ✓ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Fill material from the railroad is preventing hydric soils from forming 4-6 inch transition zone where top layer and bottom layer are mixed

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11,PIN 124781.00 City/County: Davidson Co. Sampling Date: 09/07/2021
Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-2 UPL
Investigator(s): MLB, EWD Section, Township, Range: --
Landform (hillslope, terrace, etc.): Escarpment Local relief (concave, convex, none): Convex Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: 36.331379 Long: -86.712441 Datum: WGS-84
Soil Map Unit Name: Mimosa silt loam NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Climatic conditions are abnormally wet for this time of year.
Hydrophytic vegetation unable to be determined; however, study area is still not considered a wetland due to lack of wetland hydrology and hydric soils

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 ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-2 UPL

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica (green ash)	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Sapling Stratum (Plot size: 5m)			
1. Fraxinus pennsylvanica (green ash)	50	Yes	FACW
2. Rhus glabra (smooth sumac)	30	Yes	
3.			
4.			
5.			
6.			
	80 = Total Cover		

50% of total cover: 40 20% of total cover: 16

Shrub Stratum (Plot size: 5m)			
1. Lonicera maackii (Amur honeysuckle)	20	Yes	
2.			
3.			
4.			
5.			
6.			
	20 = Total Cover		

50% of total cover: 10 20% of total cover: 4

Herb Stratum (Plot size: 1.5m)			
1. Solidago erecta (showy goldenrod)	15	Yes	
2. Geum canadense (white avens)	15	Yes	FACU
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: 10m)			
1. Parthenocissus quinquefolia (Virginia creeper)	10	Yes	FACU
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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 0 (A)	0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

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

No indicator status for smooth sumac, amur honeysuckle, or showy goldenrod. Dominance test unable to be determined.

SOIL Sampling Point: WTL-2 UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	20					SILO	
0-6	5YR 4/6	80					SILO	

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to any of numbers 1-6 of the Decision Table identifies the wetland per rule as an Outstanding National Resource Water or Exceptional Tennessee Water. A positive response to 7-13 requires a final determination by the Department.

#	Wetland Feature Decision Table WTL-2	Yes/No	Affirmative Result
1	The wetland has been designated as an **Outstanding National Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)	No	**ETW**
3	The wetland is within a state or national park, wildlife refuge, forest, wilderness area, or natural area.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of a state or federally listed threatened or endangered aquatic or semi-aquatic plant(s), or aquatic animal(s).	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g., "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an inherently valuable resource** (e.g., vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant fish and wildlife habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 or above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

TRAM Summary Worksheet

Project: Davidson Co. SR-11, PIN 124781.00 WTL-2

EXCEPTIONAL STATUS WETLANDS	Check if applicable
1. ONRW	
2. ETW	
3. Further Review Requested: Attach Wetland Background and Exceptional Status Wetlands Worksheet	

COMMENTS/NOTES:

WETLAND FUNCTION (FCI)	SCORE
Maintain Hydrologic Regime	0.25
Maintain Biogeochemical Processes	0.33
Retain Particulates (Riverine Only)	
Maintain Characteristic Plant Community	0.36
Maintain Characteristic Wildlife Community	0.35
Quantitative Score (Average of FCIsX100)	32.00
Value Added Total	
TOTAL SCORE	32.00

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 09/07/2021 Project Name SR-11, from Fannin Dr. to Old Stone Bridge Rd. PIN 124781.00

Field Personnel MLB, EWD Wetland Name/Location WTL-2

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☑ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 15
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 0
C = Percentage low density residential, construction, or similar 20
D = Percentage high density residential, or similar 0
E = Percentage urban, commercial, industrial, or similar 65

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.26

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☑ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☑ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☑ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.44

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.22
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.47

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 50

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☑ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ◉ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9** = 0.33 .

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (HYDRO) V3 0.25 (TSIZE) V5 _____ (SCOV) V7 0.47 (COMP) V9 0.33 (BUFFER)

V2 0.26 (WSHEDINT) V4 0.50 (TDEN) V6 _____ (GVC) V8 0.50 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI 1: $(V1 \times V2)^{1/2} \Rightarrow (\underline{0.25} \times \underline{0.26})^{1/2} = \underline{0.25}$

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\left(\frac{0.25+0.50}{2}\right)+0.50}{2}\right)\right)^{1/2} = \underline{0.33}$

FCI (shrubs present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\_\_\_\_+\_\_\_\_}{3}\right)\right)^{1/2} = \underline{\quad}$

FCI (ground cover) $\left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\_\_\_\_+\_\_\_\_}{5}\right)\right)^{1/2} = \underline{\quad}$

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)}{3} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{0.25+0.50+0.47}{3}\right)}{3} = \underline{0.36}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\_\_\_\_+\_\_\_\_}{2}\right)}{6} = \underline{\quad}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)}{9} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\_\_\_\_+\_\_\_\_}{2}\right)}{9} = \underline{\quad}$

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI (trees) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)+V9}{4} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{0.25+0.50+0.47}{3}\right)+\frac{0.33}{\_\_\_\_}}{4} = \underline{0.35}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)+V9}{6} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\_\_\_\_+\_\_\_\_}{2}\right)+\_\_\_}{6} = \underline{\quad}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)+V9}{9} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\_\_\_\_+\_\_\_\_}{2}\right)+\_\_\_}{9} = \underline{\quad}$

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11, from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00 City/County: Davidson Co. Sampling Date: 11/05/2021

Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-3

Investigator(s): MLB Section, Township, Range: --

Landform (hillslope, terrace, etc.): Escarpment Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR N Lat: 36.331128 Long: -86.711893 Datum: WGS-84

Soil Map Unit Name: Mimosa silt loam NWI classification: PFO

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Photo #: 27 & 28

Climatic conditions are abnormally wet for this time of year.

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

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-3

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica (green ash)	5	Yes	FACW
2. Acer negundo (boxelder)	15	Yes	FAC
3.			
4.			
5.			
6.			
	20	= Total Cover	

50% of total cover: 10 20% of total cover: 4

Sapling Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 5m)			
1. Acer negundo (boxelder)	15	Yes	FAC
2. Fraxinus pennsylvanica (green ash)	5	Yes	FACW
3.			
4.			
5.			
6.			
	20	= Total Cover	

50% of total cover: 10 20% of total cover: 4

Herb Stratum (Plot size: 1.5m)			
1. Leerisa oryzoides (rice cutgrass)	80	Yes	OBL
2. uid sedge	20	Yes	FAC
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: 10m)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

50% of total cover: 0 20% of total cover: 0

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 (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: 0 (A)	0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

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

UID sedge presumed FAC due to presence only in hydrology.

SOIL Sampling Point: WTL-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 5/2	75	2.5 yr 3/6	5	C	M	SILO	

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11, from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00 City/County: Davidson Co. Sampling Date: 11/05/2021

Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-3 UPL

Investigator(s): MLB Section, Township, Range: --

Landform (hillslope, terrace, etc.): Escarpment Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR N Lat: 36.331119 Long: -86.711852 Datum: WGS-84

Soil Map Unit Name: Mimosa silt loam NWI classification: PFO

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

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

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Climatic conditions are abnormally wet for this time of year.

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 ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-3 UPL

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Sapling Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 5m)			
1. Juniperus virginiana (Eastern red cedar)	5	Yes	FACU
2. Pyrus calleryana (Callery pear)	3	No	
3.			
4.			
5.			
6.			
	8 = Total Cover		

50% of total cover: 4 20% of total cover: 1.6

Herb Stratum (Plot size: 1.5m)			
1. Solidago erecta (showy goldenrod)	5	No	
2. Plantago lanceolata (narrowleaf plantain)	20	Yes	UPL
3. Ligustrum sinense (Chinese privet)	5	No	FACU
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: 10m)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 0 (A)	0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ____ No ✓

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

SOIL Sampling Point: WTL-3 UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10 yr 3/2	100					SILO	

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to any of numbers 1-6 of the Decision Table identifies the wetland per rule as an Outstanding National Resource Water or Exceptional Tennessee Water. A positive response to 7-13 requires a final determination by the Department.

#	Wetland Feature Decision Table WTL-3	Yes/No	Affirmative Result
1	The wetland has been designated as an **Outstanding National Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)	No	**ETW**
3	The wetland is within a state or national park, wildlife refuge, forest, wilderness area, or natural area.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of a state or federally listed threatened or endangered aquatic or semi-aquatic plant(s), or aquatic animal(s).	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g., "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an inherently valuable resource** (e.g., vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant fish and wildlife habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 or above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

TRAM Summary Worksheet

Project: Davidson Co. SR-11, PIN 124781.00 WTL-3

EXCEPTIONAL STATUS WETLANDS	Check if applicable
1. ONRW	
2. ETW	
3. Further Review Requested: Attach Wetland Background and Exceptional Status Wetlands Worksheet	

COMMENTS/NOTES:

WETLAND FUNCTION (FCI)	SCORE
Maintain Hydrologic Regime	0.50
Maintain Biogeochemical Processes	0.46
Retain Particulates (Riverine Only)	
Maintain Characteristic Plant Community	0.32
Maintain Characteristic Wildlife Community	0.36
Quantitative Score (Average of FCIsX100)	41.00
Value Added Total	
TOTAL SCORE	41.00

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 11/05/2021 Project Name SR-11, from Fannin Dr. to Old Stone Bridge Rd. PIN 124781.00

Field Personnel MLB Wetland Name/Location WTL-3

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 10
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) _____
C = Percentage low density residential, construction, or similar 20
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar 70

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.21

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☑ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☐ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☑ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.33
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.57

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☑ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ◉ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9** = 0.25 .

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.50 (HYDRO) V3 0.00 (TSIZE) V5 1.00 (SCOV) V7 0.57 (COMP) V9 0.25 (BUFFER)

V2 0.21 (WSHEDINT) V4 0.00 (TDEN) V6 0.00 (GVC) V8 1.00 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI 1: $(V1 \times V2)^{1/2} \Rightarrow (\underline{0.50} \times \underline{0.21})^{1/2}$ = 0.32

FUNCTION 2: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\left(\frac{\quad+\quad}{2}\right)+\quad}{2}\right)\right)^{1/2}$ = _____

FCI (shrubs present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{1.00+1.00}{3}\right)\right)^{1/2}$ = 0.46

FCI (ground cover) $\left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\quad+\quad}{5}\right)\right)^{1/2}$ = _____

FUNCTION 3: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

FCI (trees present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)}{3} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\quad+\quad+\quad}{3}\right)}{3}$ = _____

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{1.00+0.57}{2}\right)}{6}$ = 0.32

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)}{9} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\quad+\quad}{2}\right)}{9}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI (trees) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)+V9}{4} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\quad+\quad+\quad}{3}\right)+\quad}{4}$ = _____

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)+V9}{6} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{1.00+0.57}{2}\right)+\frac{0.25}{\quad}}{6}$ = 0.36

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)+V9}{9} \Rightarrow \frac{(FCI\ 1)+2\left(\frac{\quad+\quad}{2}\right)+\quad}{9}$ = _____

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11, PIN 124781.00 City/County: Davidson Co. Sampling Date: 09/07/2021

Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-1

Investigator(s): MLB, EWD Section, Township, Range: --

Landform (hillslope, terrace, etc.): Escarpment Local relief (concave, convex, none): Concave Slope (%): ____

Subregion (LRR or MLRA): LRR N Lat: 36.331522 Long: -86.712414 Datum: WGS-84

Soil Map Unit Name: Mimosa silt loam NWI classification: PEM

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Photo #: 23 & 24

Climatic conditions are abnormally wet for this time of year

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): 2 in.
Water Table Present?	Yes ✓	No ____	Depth (inches): SURFACE
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): SURFACE

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-1

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Sapling Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 1.5m)			
1. Cyperus esculentus (yellow nutsedge)	10	Yes	FACW
2. Echinochloa muricata (rough barnyardgrass)	20	Yes	FACW
3. Eclipta prostrata (false daisy)	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35 = Total Cover		

50% of total cover: 17.5 20% of total cover: 7

Woody Vine Stratum (Plot size: 10m)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

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 (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: 0 (A)	0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL Sampling Point: WTL-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Gravel from railroad was mixed in with soil preventing us from getting a proper soil sample.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-11, PIN 124781.00 City/County: Davidson Co. Sampling Date: 09/07/2021
Applicant/Owner: Tennessee Department of Transportation (TDOT) State: TN Sampling Point: WTL-1 UPL
Investigator(s): MLB, EWD Section, Township, Range: --
Landform (hillslope, terrace, etc.): Escarpment Local relief (concave, convex, none): Convex Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: 36.330892 Long: -86.712013 Datum: WGS-84
Soil Map Unit Name: Mimosa silt loam NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Climatic conditions are abnormally wet for this time of year

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 ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-1 UPL

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo (boxelder)	2	No	FAC
2.			
3.			
4.			
5.			
6.			
	2 = Total Cover		

50% of total cover: 1 20% of total cover: 0.4

Sapling Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 5m)			
1. Sambucus nigra (black elderberry)	10	Yes	FAC
2. Apocynum cannabinum (Indianhemp)	5	No	FACU
3. Lonicera maackii (Amur honeysuckle)	10	Yes	
4. Lonicera japonica (Japanese honeysuckle)	5	No	FACU
5.			
6.			
	30 = Total Cover		

50% of total cover: 15 20% of total cover: 6

Herb Stratum (Plot size: 1.5m)			
1. Ligustrum sinense (Chinese privet)	2	No	FACU
2. Euonymus fortunei (winter creeper)	50	Yes	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	52 = Total Cover		

50% of total cover: 26 20% of total cover: 10.4

Woody Vine Stratum (Plot size: 10m)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (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: 0 (A)	0 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ____ No ✓

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

Indicator status of Lonicera maackii was unavailable.

SOIL Sampling Point: WTL-1 UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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) **(LRR N, MLRA 147, 148)**
- ___ 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 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 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Gravel from railroad was mixed in with soil preventing us from getting a proper soil sample.

An affirmative response to any of numbers 1-6 of the Decision Table identifies the wetland per rule as an Outstanding National Resource Water or Exceptional Tennessee Water. A positive response to 7-13 requires a final determination by the Department.

#	Wetland Feature Decision Table WTL-1	Yes/No	Affirmative Result
1	The wetland has been designated as an **Outstanding National Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)	No	**ETW**
3	The wetland is within a state or national park, wildlife refuge, forest, wilderness area, or natural area.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of a state or federally listed threatened or endangered aquatic or semi-aquatic plant(s), or aquatic animal(s).	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g., "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an inherently valuable resource** (e.g., vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant fish and wildlife habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 or above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

SITUATION	TRAM REQUIRED

WTL-1 →

- Wetland is a "roadside ditch" and not part of a larger wetland – constructed primarily to convey runoff……...NO, COMPLETE EXCEPTIONAL STATUS WETLAND SECTION ONLY

- Fringe wetlands associated with ponds, impoundments, reservoirs, large lakes…….YES- USE NON-HGM TRAM

- Created Depression wetlands, semi-permanent to permanently inundated (<6.6-feet deep)……...…….YES-USE NON-HGM TRAM

- Wetland impacts greater than 0.10 acre….....YES

NOTE: The Exceptional Status Wetland section must be completed for all proposed wetland alterations, including wetlands situations where HGM assessment is not required or the Non-HGM TRAM is used, including proposed wetlands impacts less than 0.10 acre.

Ecology Field Data Sheet: **Water Resources**

Project:	Davidson Co. SR-11 (US-31W, North Main Street), from Fannin Drive to Old Stone Bridge Road, including CSX R/R Overpass Structure PIN 124781.00				
Biologist:	MLB, SLN	**Affiliation:**	TDOT	**Date:**	08/26/2021

1-Station: from plans										
2-Map label and name	STR-3									
3-Latitude/Longitude	36.330152, -86.711607									
4-Feature description:										
-channel identification	perennial stream ☑		intermittent stream ☐		ephemeral stream ☐		wwc ☐			
-HD score (if applicable)										
-OHWM indicators	bed & banks ☐		deposition ☐		presence of litter / debris ☐		scour ☐		veg absent, bent, matted ☑	
	change in plant community ☐		destruction of terrestrial veg ☑		multiple observed flow events ☐		sediment sorting ☐		water staining ☐	
	change in soil character ☐		leaf litter disturbed or absent ☑		natural line impressed on bank ☐		shelving ☐		wracking ☐	
-channel bottom width	1.5 ft			-top of bank width		1.5 ft				
-width at ordinary high water mark	1.5 ft, 2 in. from bottom									
-bank height	LDB - 3.5 ft				RDB - 3.5 ft					
-riffle/pool complex or other specialized habitat present?	no									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: None									
	RDB: boxelder, green ash, bush honeysuckle, black walnut, Chinese privet									
-date of PJD request										
5-photo numbers	5 & 6									
6-HUC -8 Code & Name	05130202, Cheatham Lake									
7-Assessed	yes	☐	no	☑						
8-ETW	yes	☐	no	☑						
9-303 (d) List	yes	☐	siltation	☐	habitat:	☐	other:	☐		
	no	☑								
10-Notes	Feature is at the toe of the railroad bed									
Substrate	gravel/ballast bed									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody:	Date/Time: 08/26/2021
Assessors/Affiliation: MLB, SLN -TDOT	Project ID : 124781.00
Site Name/Description: STR-3	
Site Location:	
HUC (12 digit): 051302020301, Madison Creek	Lat/Long:
Previous Rainfall (7-days) : 2.42 inches	36.330152, -86.711607
Precipitation this Season vs. Normal : (abnormally wet) elevated average low abnormally dry unknown	
Source of recent & seasonal precip data : NOAA past weather/AgACIS last 7 days	
Watershed Size : <0.5 square miles	County: Davidson Co.
Soil Type(s) / Geology : Mimosa silt loam, 5 to 12 percent slopes, eroded	Source: NRCS
Surrounding Land Use : Industrial, railroad	
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	✓	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 = STREAM

Secondary Indicator Score (if applicable) =

Justification / Notes :

multiple seeps observed on RDB, iron sheen on water surface

TENNESSEE D.O.T.
S.T.I.D.
FILE NO.

TYPE	YEAR	COUNTY	FIGURE NO.
ETSA	2019	DAVIDSON	5

0' 200' 400' 600'

N

ENVIRONMENTAL TECHNICAL STUDY AREA

CSX WIDENING CONCEPT
STATE ROUTE 11
L.M. 24.86 TO L.M. 24.99
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

FIGURE 5
S.R. 11

9/2/2009 12:00:23 PM
X:\Projects\Davidson\SR 11\Dickerson Pike, CSX Bridge Overpass\Microstation\ETSA\sht05_SR-11_CSX Level Concept.dgn

TENNESSEE D.O.T.
S.T.I.D.
FILE NO.

TYPE	YEAR	COUNTY	FIGURE NO.
ETSA	2019	DAVIDSON	6

0' 200' 400' 600'

N

ENVIRONMENTAL TECHNICAL STUDY AREA

CSX WIDENING CONCEPT
STATE ROUTE 11
L.M. 24.86 TO L.M. 24.99
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

FIGURE 6
S.R. 11

9/2/2009 10:30:22 AM
X:\Projects\Davidson\SR 11\Dickerson Pike, CSX Bridge Overpass\Microstation\ETSA\sht06_SR-11_CSX LevelConcept.dgn

TYPE	YEAR	COUNTY	FIGURE NO.
ETSA	2019	DAVIDSON	7

TENNESSEE D.O.T.
S.T.I.D.
FILE NO.

0' 200' 400' 600'

N

ENVIRONMENTAL TECHNICAL STUDY AREA

CSX WIDENING CONCEPT
STATE ROUTE 11
L.M. 24.86 TO L.M. 24.99
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

FIGURE 7
S.R. 11

9/13/2019 6:41:32 AM
X:\Projects\Davidson\SR II\Dickerson Pike, CSX Bridge Overpass\Microstation\ETSA\sht07_SR-II_CSX LevelConcept.dgn

TYPE	YEAR	COUNTY	FIGURE NO.
ETSA	2019	DAVIDSON	8

TENNESSEE D.O.T.
S.T.I.D.
FILE NO.

0' 200' 400' 600'

ENVIRONMENTAL TECHNICAL STUDY AREA

CSX LEVEL 1 CONCEPT
STATE ROUTE 11
L.M.24.86 TO L.M.24.99
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

FIGURE 8
S.R. 11

9/2/2009 11:54:9 AM
X:\Projects\Davidson\SR 11\Dickerson Pike, CSX Bridge Overpass\Microstation\ETSA\sht08_SR-11_CSX Level Concept.dgn

Photo 1: STR-1, view downstream

Photo 2: STR-1, view upstream

Photo 3: STR-2, Manskers Creek, view upstream

Photo 4: STR-2, Manskers Creek, view downstream

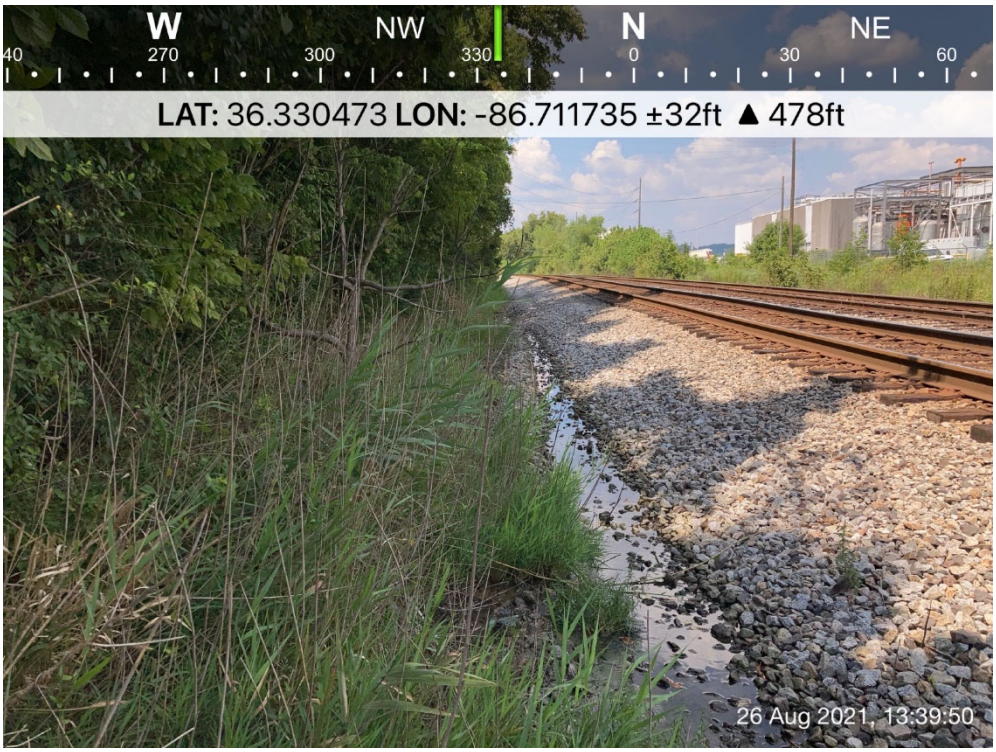


Photo 5: STR-3, view upstream

Photo 6: STR-3, view downstream

Photo 7: STR-4, view downstream

Photo 8: STR-4, view upstream

Photo 9: STR-5, Lumsley Fork, view usptream

Photo 10: STR-5, Lumsley Fork, view downstream

Photo 11: STR-6, view downstream

Photo 12: STR-6, view upstream showing beginning

Photo 13: WWC-1/EPH-1, view downgradient

Photo 14: WWC-1/EPH-1, view upgradient

Photo 15: WWC-2/EPH-2, view upgradient

Photo 16: WWC-2/EPH-2, view downgradient

Photo 17: WWC-3/EPH-3, view upgradient

Photo 18: WWC-3/EPH-3, view downgradient

Photo 19: WWC-4/EPH-4, view upgradient

Photo 20: WWC-4/EPH-4, view downgradient

Photo 21: WWC-5/UDF-1, view upgradient

Photo 22: WWC-5/UDF-1, view downgradient

Photo 23: WTL-1

Photo 24: WTL-1

Photo 25: WTL-2

Photo 26: WTL-2

Photo 27: WTL-3

Photo 28: WTL-3

Project: SR-11, from Fannin Drive to Old Stone Bridge, including the CSX R/R Overpass Structure PIN: 124781.00 PE: 19031-1217-14

Date of field study: 08/26/21 – 11/10/21 Date TDEC database checked: 08/23/21 Completed by: MLB

Species reported within 1 mile radius of project:

Species Scientific and common names, followed by (A) for animal or (P) for plant	Status		Species is potentially present in R-O-W because: **(A)** it is listed by TDEC within ROW **(B)** habitat is present **(C)** observed during site visit **(D)** critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: **(A)** Present habitat unsuitable **(B)** Not observed during site visit **(C)** Original record questionable **(D)** Considered extinct/extirpated	Accommodations to minimize impacts: **(A)** BMPs are sufficient to protect species **(B)** Special Notes are included on project plans **(C)** Individuals will be impacted. **(D)** Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Comments / ACOE Effects Determination Notes
	Fed	TN					
Streamside Salamander, *Ambystoma barbourin* (A)	--	E	B		B	A. barbouri can be found in glades and cedar woodlands close to streams, as well as seasonally ephemeral and intermittent karst streams in middle Tennessee (Krous and Petranka, 1989; TDEC 2016). It breeds in shallow limestone streams with flat rock or boulders and natural barriers that prevent fish migration upstream from December to February in Middle Tennessee (TDEC DNA, 2019). Populations occur in the Cumberland, Stones, Harpeth and Red Rivers watersheds (NatureServe 2019). LOD: 2020	-Species sweep required per TWRA -In-stream construction prohibition from December 15th through June 1st per TWRA

Project: SR-11, from Fannin Drive to Old Stone Bridge, including the CSX R/R Overpass Structure PIN: 124781.00 PE: 19031-1217-14

Species reported within 1-mile to 4-mile radius of project:

Species Scientific and common names, followed by (A) for animal or (P) for plant	Status		Species is potentially present in R-O-W because: **(A)** it is listed by TDEC within ROW **(B)** habitat is present **(C)** observed during site visit **(D)** critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: **(A)** Present habitat unsuitable **(B)** Not observed during site visit **(C)** Original record questionable **(D)** Considered extinct/extirpated	Accommodations to minimize impacts: **(A)** BMPs are sufficient to protect species **(B)** Special Notes are included on project plans **(C)** Individuals will be impacted. **(D)** Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Comments / ACOE Effects Determination Notes
	Fed	TN					
Streamside Salamander, *Ambystoma barbourin* (A)	--	E	B		B	A. barbouri can be found in glades and cedar woodlands close to streams, as well as seasonally ephemeral and intermittent karst streams in middle Tennessee (Krous and Petranka, 1989; TDEC 2016). It breeds in shallow limestone streams with flat rock or boulders and natural barriers that prevent fish migration upstream from December to February in Middle Tennessee (TDEC DNA, 2019). Populations occur in the Cumberland, Stones, Harpeth and Red Rivers watersheds (NatureServe 2019). LOD: 2020	-Species sweep required per TWRA -In-stream construction prohibition from December 15th through June 1st per TWRA
Davis' Sedge, *Carex davisii* (P)	--	S		A	A	Davis' Sedge habitat includes bottomlands, riparian soils, and calcareous floodplain forests and meadows in the Western Highland Rim and Central Basin. Both flowering and fruiting occurs between May and July. (TN Flora Committee, 2015; TDEC, 2016). LOD: 1968	
Prairie Parsley, *Polytaenia nuttallii* (P)	--	T		A	A	In Prairie Parsley's native range, it is found in high quality prairie and rarely found in areas of disturbance, such as roadsides. Prairie Parsley may remain as a basal rosette of leaves for 2 or more years before bolting and producing flowers and fruit, after which the plant dies. Though it may produce abundant fruit, little of it germinates. The leaves are more finely divided than other yellow-flowering members of the carrot family, such as Wild Parsnip (Pastinaca sativa), Hairy-jointed Meadow Parsnip (Thaspium barbinode) or Alexanders (Zizia species). LOD: 1882	
Baker Station Cave Beetle, *Pseudanophthalmus insularis* (A)	--	Rare, not state listed		A	A	Niemiller et al. (2017) confirmed the existence of this species in two caves in 2013 and 2014; it was previously thought to be possibly extinct. Niemiller et al. (2017) collected this beetle at Bakers Station Cave in 2013 and Blasted Spring Cave in 2014. Prior to this, it had not been observed for 60 years from either of the two historical localities. No other cave beetles were observed during additional surveys of five nearby caves in Cheatham (two caves), Davidson (two caves), and Sumner (one cave) counties (Niemiller et al. 2017). LOD: 1960	

Project: SR-11, from Fannin Drive to Old Stone Bridge, including the CSX R/R Overpass Structure PIN: 124781.00 PE: 19031-1217-14

Migratory Birds

List *significant concentrations* of migratory birds encountered within the project area (rookeries, aggregations, nesting areas, etc).

Species (Scientific and Common Name)	Approximate No. of Nests (or Individuals)	Location of Nests (or Individuals) (Include Latitude & Longitude)	Nesting Dates and Reference	Photograph #
None				

USFWS letter: Yes __X__ (attached) No ___ (explain)

Biological Assessment: Yes ___ (response letter attached; see below) No __X__

Species (scientific and common names)	USFWS conclusion[1]

[1] Choose from “no effect"; "not likely to adversely affect;" or "likely to adversely affect;". If “likely to adversely affect” is chosen, indicate "no jeopardy to species and no adverse modification to habitat” or “jeopardy to species, or adverse modification to habitat” based on FWS concurrence letter

List Natural Areas, management areas, refuges, or similar sites within or adjacent to project (attach 7.5 minute topographic map with pertinent boundaries of area marked)

Area Name	Type of Area	Pertinent Notes
None		

List locations that contain potential Indiana bat habitat (Provide an aerial that indicates areas checked)

Location (description; lat/long or station number)	Tree Species	Photograph #
None		

Other Species Determination as Requested by USACOE: Yes __X__ No ___

Species (scientific and common names)	USACOE Effects Determination
Indiana bat, *Myotis sodalis*	Section 7 Clearance Granted
Northern long-eared bat, *Myotis septentrionalis*	Section 7 Clearance Granted

Madalyn Brown

From: Casey Parker
Sent: Wednesday, December 8, 2021 10:55 AM
To: Madalyn Brown
Cc: Vincent Pontello; TDOT.Env Ecology
Subject: RE: Coordination Request - Davidson Co, SR-11 Widening, PIN 124781.00

Subject: Coordination Request - Davidson Co, SR-11 Widening, PIN 124781.00

Ms. Madalyn Brown,

The Tennessee Wildlife Resources Agency has reviewed the information that you provided regarding the proposed widening of SR-11 in Davidson County, Tennessee. In-stream work is expected, therefore to minimize impacts to the State Endangered species, Streamside Salamander - *Ambystoma barbouri* (2020), I am requesting species sweeps immediately prior to in-stream work and relocating the species to suitable habitat upstream of a barrier. Additionally, survey preference is recommended from December 15th through March 15th for this species and prohibit in-stream construction from December 15th through June 1st to minimize impacts during breeding season and development of embryos. Thank you for the opportunity to review and comment, please contact me if you need further assistance.

Casey Parker - Wildlife Biologist
Liaison to TDOT & Federal Highway Administration
Tennessee Wildlife Resources Agency
Environmental Services Division
Email: casey.parker@tn.gov

From: Madalyn Brown <Madalyn.Brown@tn.gov>
Sent: Friday, November 12, 2021 2:19 PM
To: Casey Parker <Casey.Parker@tn.gov>
Cc: Vincent Pontello <Vincent.Pontello@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>
Subject: Coordination Request - Davidson Co, SR-11 Widening, PIN 124781.00

Good Afternoon Casey,

TDOT is requesting your review and comment on the subject project. The project involves widening SR-11 to five lanes and replacing the CSX overpass. I have attached supporting information and a KMZ file for the project. Please let me know if you have any questions or need additional information.

Thank You,

Madalyn Brown l Environmental Studies Specialist
Region 3 Environmental Tech Group
6601 Centennial Blvd. Bldg A 2nd Floor
Nashville, TN 37243-0360
Office: (615) 350-4209
Cell: (615) 956-1029

Madalyn Brown

From: Griffith, John <john_griffith@fws.gov>
Sent: Wednesday, December 1, 2021 3:52 PM
To: Madalyn Brown
Cc: R3 EnvTechOffice; TDOT.Env Ecology; Sikula, Nicole R
Subject: Re: [EXTERNAL] Coordination Request - Davidson Co, SR-11 Widening, PIN 124781.00

Madalyn,

Thank you for your correspondence regarding the proposed State Route (SR) 11 widening from Fannin Drive to Old Stone Bridge Road in Davidson County, Tennessee. The project would involve widening of SR 11 to five lanes and replacement of the CSX Railroad Overpass. You have requested a list of federally threatened or endangered species that may be present in the project area.

A review of our database does not indicate that any federally listed or proposed species occur in your project area. Therefore, based on the best information available at this time, we believe that the requirements of the Endangered Species Act (ESA) are fulfilled for all species that currently receive protection under the ESA. Obligations under section 7 of the ESA should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

The information provided indicate that wetlands are present within the proposed alignment. The U.S. Army Corps of Engineers, Nashville District, Regulatory Branch can be reached at 615-369-7500.

TDOT would ensure that standard construction BMPs are implemented and that construction-related pollutants are kept out of area streams. Equipment staging and maintenance areas should be located an appropriate distance from streams to prevent entry of petroleum-based pollutants into the water. Fresh concrete and cement dust must be kept out of the water as they alter chemical properties and can be toxic to aquatic species.

This email will serve as our official project response. Please let me know if we can offer further assistance. Thanks,

John Griffith
Transportation Biologist
U.S. Fish and Wildlife Service
Tennessee Field Office
931-525-4995 (office)
931-528-7075 (fax)

From: Madalyn Brown <Madalyn.Brown@tn.gov>
Sent: Friday, November 12, 2021 2:23 PM
To: Griffith, John <john_griffith@fws.gov>
Cc: R3 EnvTechOffice <R3.EnvTechOffice@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>
Subject: [EXTERNAL] Coordination Request - Davidson Co, SR-11 Widening, PIN 124781.00

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good Afternoon John,

TDOT is requesting your review and comment on the subject project. The project involves widening SR-11 to five lanes and replacing the CSX overpass. I have attached supporting information and a KMZ file for the project. Please let me know if you have any questions or need additional information.

Thank You,

Madalyn Brown l Environmental Studies Specialist
Region 3 Environmental Tech Group
6601 Centennial Blvd. Bldg A 2nd Floor
Nashville, TN 37243-0360
Office: (615) 350-4209
Cell: (615) 956-1029

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

December 13, 2021

Madalyn Brown
TDOT
6601 Centennial Blvd Bldg. A 2nd Floor
Nashville, TN 37243

Subject: SR-11 Widening to Five Lanes and CSC Overpass Replacement
TDOT PIN 124781.00
Northern Terminus SR-11: (36.33900° -86.71798°)
Southern Terminus SR-11: (36.33349° -86.71716°)
Northern Terminus CSX: (36.34612° -86.72647°)
Southern Terminus CSX: (36.32716° -86.71013°)
Stream Section of UNT to Mansker Creek #1: (36.33478° -86.71738°)
Stream Section of UNT to Mansker Creek #2: (36.33605° -86.71632°)
Davidson County, TN
Rare Species Database Review

Dear Ms. Brown:

Thank you for your correspondence of 12 November 2021 requesting a rare species database review for the proposed widening of SR-11 and replacement of a CSX overpass.

We have reviewed the state's natural heritage database with regard to the project boundaries, and we find that the following rare species has been observed previously within one mile of the project area:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vertebrate Animal	*Ambystoma barbouri*	Streamside Salamander	G4	S2	--	E	Seasonally flowing karst streams; middle Tennessee.

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	*Carex davisii*	Davis' Sedge	G4	S1	--	S	Bottomlands, Riparian Soils

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	*Dalea foliosa*	Leafy Prairie-clover	G2G3	S2S3	LE	E	Rocky Washes in Glades
Vascular Plant	*Polytaenia nuttallii*	Prairie Parsley	G5	S1	--	T	Prairies and Open Dry Areas
International Vegetation Classification - Natural	*Quercus stellata / Viburnum rufidulum / Schizachyrium scoparium - (Sorghastrum nutans, Helianthus eggertii) Woodland*	Western Highland Rim Escarpment Post Oak Barrens	G2G3	S2	--	Rare, Not State Listed	
Invertebrate Animal	*Pseudanophthalmus insularis*	Baker Station Cave Beetle	G1	S1	--	Rare, Not State Listed	Terrestrial cave obligate; northern Central Basin; known from single historical record in Davidson County.

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 do not anticipate any impacts to occurrences of rare, threatened, or endangered plant species from this project.

We ask that you coordinate this project with the Tennessee Wildlife Resources Agency contact assigned to your agency 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. Please ensure that best management practices to address erosion and sediment are implemented and maintained during construction activities. Note that the General Aquatic Resource Alteration Permit states that "use of monofilament-type erosion control netting or blanket is prohibited in the stream channel, stream banks, or any disturbed riparian areas within 30 feet of top of bank." Where necessary and feasible, we encourage use of biodegradable netting under the CGP (Construction General Stormwater Permit) as well.

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