DAVEY Resource Group

801 Rep. John Lewis Way S, Suite 206
Nashville, TN 37203
615-460-9797

June 11, 2024

Ms. Joellyn Brazile
TDEC Division of Water Resources
Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, Tennessee 38133

Re: Response to ARAP Compliance Inspection Letter
NRS21.238 – Blue Oval City
Stanton, Haywood County, Tennessee

Dear Ms. Brazile,

We write in response to the referenced Aquatic Resource Alteration Permit (ARAP) Compliance Inspection letter dated April 23, 2024. The letter summarized the conditions documented during the November 15, 2023, inspection, and included a copy of the compliance inspection report and a photographic log of the findings. According to the letter, many of the issues cited in the report have been resolved, however resolution of two alleged violations of the ARAP under General Condition #5 of ARAP NRS21.238 were requested on or before June 11, 2024. The required actions are repeated below in italics, followed by our response. Supplemental appendices have been attached to this letter.

- On or before June 11, 2024, submit the following to the Division:
  1) *A detailed plan utilizing data driven methods using aspects of natural channel design that documents elements of the channel such as watershed hydrology, channel hydraulics, sediment transport, lateral site constraints and morphological reference conditions within the ecoregion. The plan should include specific information regarding the linear footage of stream channel for Stream 1-A and Stream 9 that was initially authorized under NRS21.238, information regarding the amount of fill that occurred to either/both channels and specific information regarding the realignment/relocation, including but not limited to linear length.*

  2) *A 12-point mitigation plan (following Section 5.2.2 of the Division's Stream Mitigation Guidelines) that includes documenting the stream's existing conditions (pre-impact), proposed condition and monitoring requirements. Replacement channels will need to be vegetated, have a natural channel bottom, and have channel stability, both laterally and vertically throughout the monitoring period. Please consult credible sources such as the Natural Resource Conservation Services National Engineering Handbook Stream Restoration Design or the TN Department of Transportation Design Division Drainage Manual, Chapter 11, Natural Stream Design or the Division's Compensatory Mitigation website. The 12-point mitigation plan must use the TNSQT or other scientifically defensible and approve method to determine functional loss and lift of the project. The plan should also include any channel modifications that will be required to meet the Division's Stream Mitigation Guidelines.*

Applicant's Response to Compliance Inspection Letter

Davey Resource Group (DRG) and Ford Motor Company (Permittee) acknowledge that site development activities involving portions of Stream 1-A and Stream 9 were modified from the specific activities authorized by the ARAP issued for the Blue Oval City project (NRS21.238). Descriptions of the authorized and modified impacts are included in the paragraphs below. Details regarding compensatory mitigation for the modified impacts as well as proposed actions to comply with the conditions set out in NRS21.238 are also included.

The Blue Oval City ARAP (NRS21.238) authorized stream impacts resulting in a total of -8,616 Functional Feet (FF) of loss for the project. Compensatory mitigation for the impacts was provided through Permittee Responsible Mitigation (PRM) at the Cub Creek Mitigation Site. According to the November 2021 PRM Mitigation Plan included in the ARAP, a total of 10,347 FF of stream mitigation credits would be generated. This amount sufficiently covers the authorized -8,616 FF of functional loss from the Blue Oval City project and also provides a reserve of up to 1,731 FF for compensatory mitigation for functional losses applicable under the issued ARAP, including those resulting from modified impacts (Table 1).

Table 1. Summary of proposed impacts under NRS21.238

Reach ID	Impact Description	Impact Length (ft)	ECS	Impact Tier	Total Functional Feet (FF)
Stream 1-A	Box Culvert	2,777	0.66	Tier 5	-1,610.7
Stream 1-B	Fill	97	0.74	Tier 6	-71.8
Stream 1-B	Channelization	67	0.74	Tier 6	-49.6
Stream 2	Fill	2,598	0.69	Tier 6	-1,792.6
Stream 4-A	Fill	6,220	0.68	Tier 6	-4,229.6
Stream 9	Channelization	113	0.67	Tier 6	-75.7
Stream 9	Box Culvert	482	0.67	Tier 5	-284.4
Stream 11	Fill	783	0.64	Tier 6	-501.1
TOTAL FUNCTIONAL LOSS					**-8,616**
PRM TOTAL FUNCTIONAL LIFT					**10,347**
RESERVE FUNCTIONAL FOOTAGE					**1,731**

Stream 1-A

A 4-sided box culvert (12' x 6') was authorized for 2,777 linear feet (LF) on Stream 1-A resulting in a functional loss of -1,160.7 FF. During construction, the downstream portion of the channel (1,567 LF) was encapsulated, and the upstream portion (1,210 LF) was diverted to the south and reconnected with Stream 9 (Figure 1). This modification resulted in 462 cubic yards of fill (0.29 acres). The new channel was constructed similarly to the specifications of Stream 2 (Attachment F of the ARAP application) and the banks were stabilized with annual rye. Based on the ECS values reported in NRS21.238, these modified impacts amount to -1,707.4 FF, resulting in an additional -96.7 FF of loss than that which was accounted for in the ARAP (Table 2). A TNSQT Debit Calculator Tool for Stream 1-A modified impacts is provided in Appendix 2. Mitigation credits generated by the

Cub Creek Mitigation Site to compensate for functional losses under the Blue Oval ARAP are sufficient to cover this additional functional loss. Accordingly, no further compensatory mitigation is required.

Table 2. Comparison of proposed and modified impacts on STR 1-A

	Impact Type	Impact Tier	ECS	Impact (LF)	Total Functional Loss (FF)
Proposed Impact					
Stream 1-A	4-sided box culvert	Tier 5	0.66	2,777	**-1,610.7**
			Proposed Impact TOTALS	2,777	**-1,610.7**
Modified Impact					
Stream 1-A	Fill	Tier 6	0.66	1,210	-798.6
Stream 1-A	4-sided box culvert	Tier 5	0.66	1,567	-908.8
			Modified Impact TOTALS	2,777	**-1,707.4**
				Difference in Proposed and Modified Impact Functional Footage	**-96.7**
				Reserve Functional Footage	**1,731**

In addition to the mitigation credits generated by the PRM, stream function measurements indicate that additional mitigation in not necessary to accommodate the modified impacts to Stream 1-A. TNSQT data provided in the ARAP application utilized a limited set of TNSQT Function-Based Parameters – Catchment Hydrology, Reach Runoff, Riparian Vegetation (Buffer Width only), and Plan Form. Default values were used for all other categories which inflated Existing Condition Scores (ECS) that were not accurate representations of the pre-impact conditions of the streams. Therefore, the total functional loss proposed in the ARAP application is greater than the actual loss that has occurred from the project.

To demonstrate this point, DRG collected TNSQT data on an upstream and undisturbed portion of Stream 1-A and calculated the ECS for pre-impact conditions. Additional Function-Based Parameters (Catchment Hydrology, Reach Runoff, Floodplain Connectivity, Large Woody Debris, Riparian Vegetation, Bed Form Diversity, and Plan Form) were assessed and an ECS of 0.43 was calculated for STR 1-A. This data shows an accurate representation of the existing condition of Stream 1-A prior to the impact. Based on the revised and more comprehensive TNSQT data, the calculated functional loss of the modified impacts to Stream 1-A is -1,115.7 FF which is 495 FF less than the originally authorized functional loss of 1,610.7 FF (Table 3). A TNSQT Debit Calculator Tool for Stream 1-A modified impacts with the revised existing condition score is provided in Appendix 3.

Table 3. Functional loss of modified impacts to STR 1-A using revised ECS value (0.43)

	Impact Type	Impact Tier	ECS	Impact (LF)	Total Functional Loss (FF)
Stream 1-A	Fill	Tier 6	0.43	1,210	-520.3
Stream 1-A	4-sided box culvert	Tier 5	0.43	1,567	-595.4
			TOTAL	2,777	**-1,115.7**
			Proposed Functional Loss for Stream 1-A	**2,777**	**-1,610.7**
			Net Difference in FF		**+495**

DRG has determined that the post-impact resource value of Stream 1-A as a result of the channel diversion is significantly greater than the post-impact resource value of the channel as a result of the originally proposed impact via encapsulation. To quantify this, condition scores were calculated for the Stream 1-A post-impact channels –proposed and modified – and multiplied by the linear footage of post-impact channels. The condition score for the proposed encapsulation of Stream 1-A (0.08) was based on the autogenerated PCS determined by the TNSQT Debit Tool Calculator. Because the diverted portion of Stream 1-A is still providing some functionality and generated additional stream footage, the TNSQT Rapid Data Collection Methods were used to determine the post-impact condition score and the added stream footage created from the diversion (368 LF) was used to calculate the overall resource value for the modified impacts. The proposed impacts would have resulted in a channel with a resource value of 222.2 FF and the modified impacts have resulted in a channel with a resource value of 803.9 FF (Table 4). The diversion of Stream 1-A has resulted in a channel that remains daylighted and is a significant improvement from the proposed encapsulation. Furthermore, the condition score of the diverted channel is equal to the condition score of the undisturbed, upstream portion of Stream 1-A. The Existing Condition Assessment data and corresponding Rapid Data Sheets for the upstream portion of Stream 1-A are provided in Appendix 3. Additionally, the Existing Condition Assessment data and corresponding Rapid Data Sheets for Stream 1-A Diversion are provided in Appendix 4.

Table 4. Comparison of post-impact conditions for authorized and unauthorized impacts on Stream 1-A

	Post-Impact Channel Description	Post-Impact Condition Score	Stream Length (LF)	Resource Value (FF)
Proposed Impact				
Stream 1-A	Encapsulated Channel	0.08	2,777	222.2
		Proposed TOTALS	**2,777**	**222.2**
Modified Impact				
Stream 1-A	Diverted Channel	0.43*	1,578	678.5
Stream 1-A	Encapsulated Channel	0.08	1,567	125.4
		Modified TOTALS	**3,145**	**803.9**

**Calculated using TNSQT Rapid Data Collection Methods and Existing Condition worksheet in Debit Tool Calculator*

Stream 2

Stream 2 was authorized for unavoidable impacts resulting from the fill of 2,598 linear feet of stream and conveyance of stream flow to Stream 9 through the creation of a 750 linear foot open channel with stabilized banks. The impacts were considered a Tier 6 impact and resulted in a loss of -1,792.6 FF (Table 1). Proposed impacts to Stream 2 are nearly identical to the modified impacts incurred on Stream 1-A, which suggests that a Tier 6 impact severity tier is an appropriate determination for the filled portion of Stream 1-A.

Stream 9

Stream 9 was authorized for unavoidable impacts resulting from the channelization of 113 LF of stream and encapsulation of 482 LF of stream. The channelized portion was considered a Tier 6 impact resulting in the loss of -75.7 FF, and the encapsulated portion was considered a Tier 5 impact resulting in the loss of -284.4 FF.

During TDEC's November 15, 2023, compliance inspection site visit, water was impounded on the upgradient end of the work area within Stream 9. Since the site visit, the channel has been returned to a free-flowing stream

and all material contributing to the impounded water has been removed. No fill was permanently placed in the channel. Photographs of Stream 9 are included in Appendix 6.

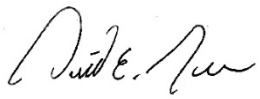
Proposed Actions

In order to comply with the remaining conditions of the ARAP, the Permittee proposes to take the following actions:

- Remove monofilament erosion blankets on channel banks of Stream 2
- Implement a comprehensive Planting Plan (Appendix 5) to further stabilize the riparian zone of Stream 1-A and Stream 2
- Conduct monitoring for Stream 1-A Diversion per Special Condition #3 (in addition to monitoring for Stream 2, Stream 9 and Stream 1-B)

We appreciate your consideration of our responses to your Compliance Inspection Letter. Please contact us at (615) 400-8476 if you have further questions or need additional information.

Sincerely,



David E. Jackson, PG, PH
Principal / Area Manager
Davey Resource Group, Inc.
www.daveyresourcegroup.com

Appendix 1: Figures

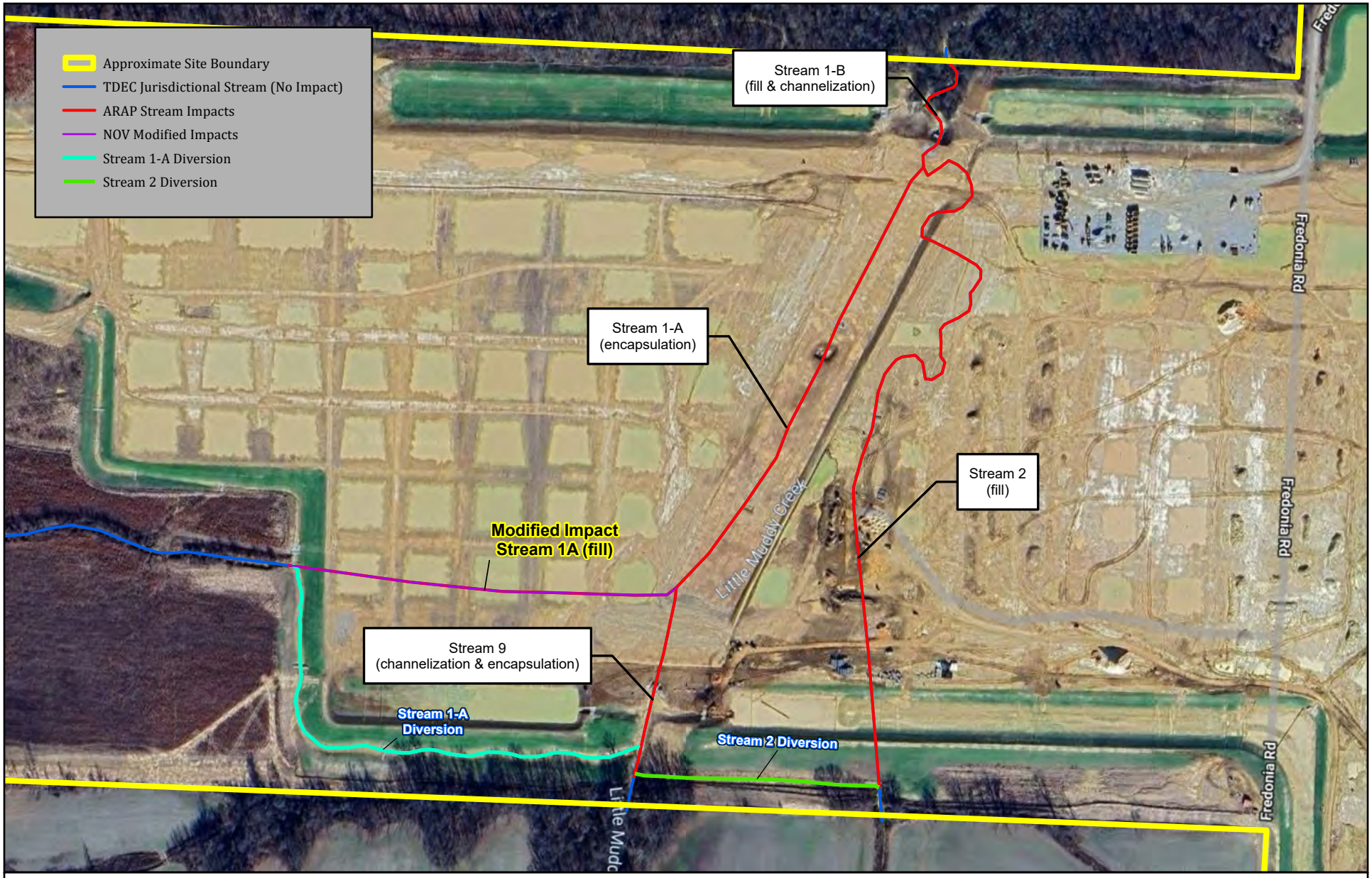


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Figure 1. Modified Impact Map
Ford Blue Oval
Haywood County, Tennessee

0 250 500 Feet

N

Date: 6/4/2024
NAD 1983 2011 StatePlane Tennessee FIPS 4100 Ft US
89.44383°W 35.43036°N
Prepared for: Tennessee Department of Environment and Conservation
Prepared by: Davey Resource Group
Sources: Google 2024 Aerial Imagery, Site Visit 5/15/2024.

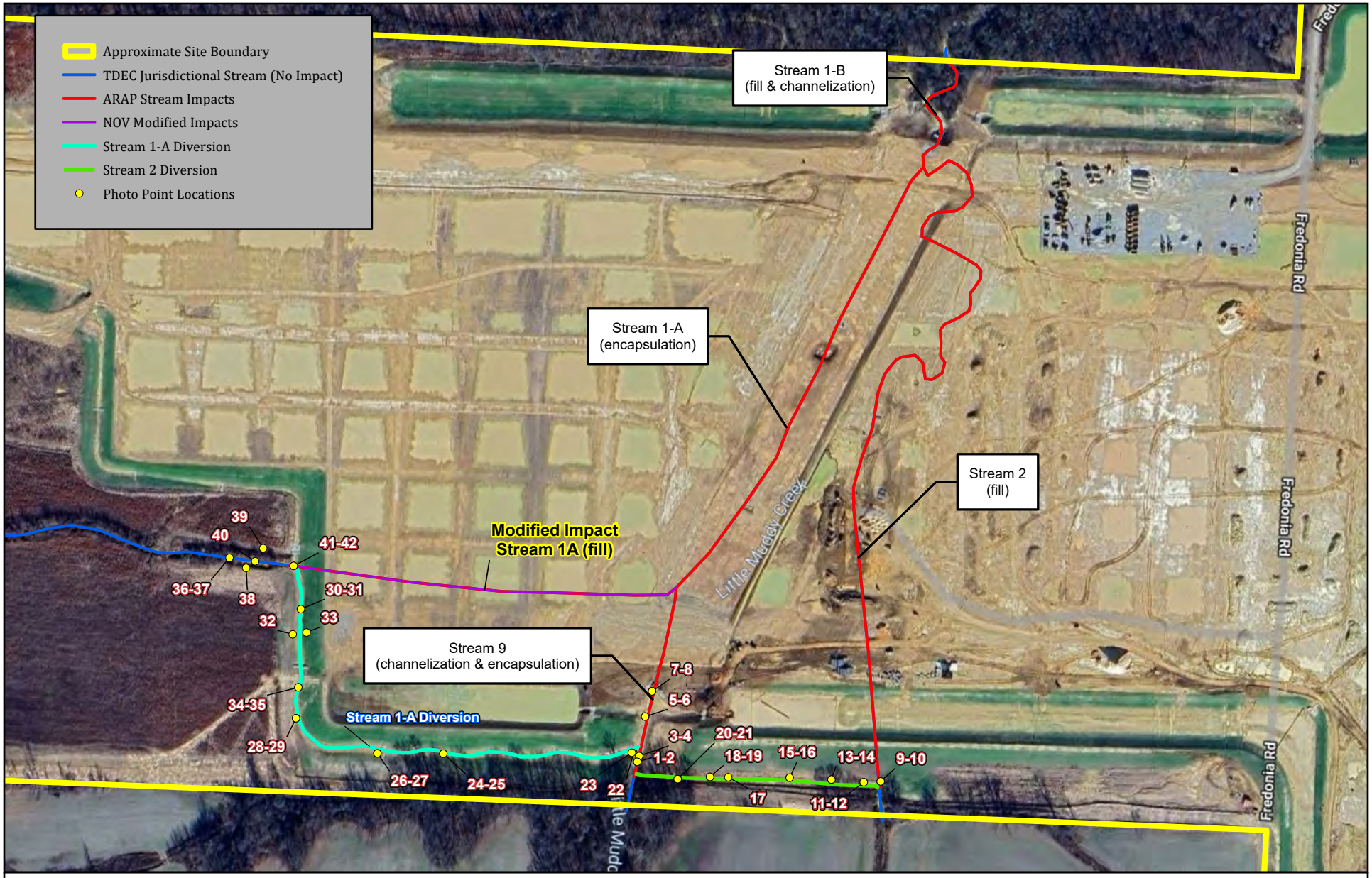

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Figure 2. Modified Impact Map with Photo Point Locations
Ford Blue Oval
Haywood County, Tennessee

0 250 500 Feet

N

Date: 6/4/2024
NAD 1983 2011 StatePlane Tennessee FIPS 4100 Ft US
89.44383°W 35.43036°N
Prepared for: Tennessee Department of Environment and Conservation
Prepared by: Davey Resource Group
Sources: Google 2024 Aerial Imagery, Site Visit 5/15/2024.

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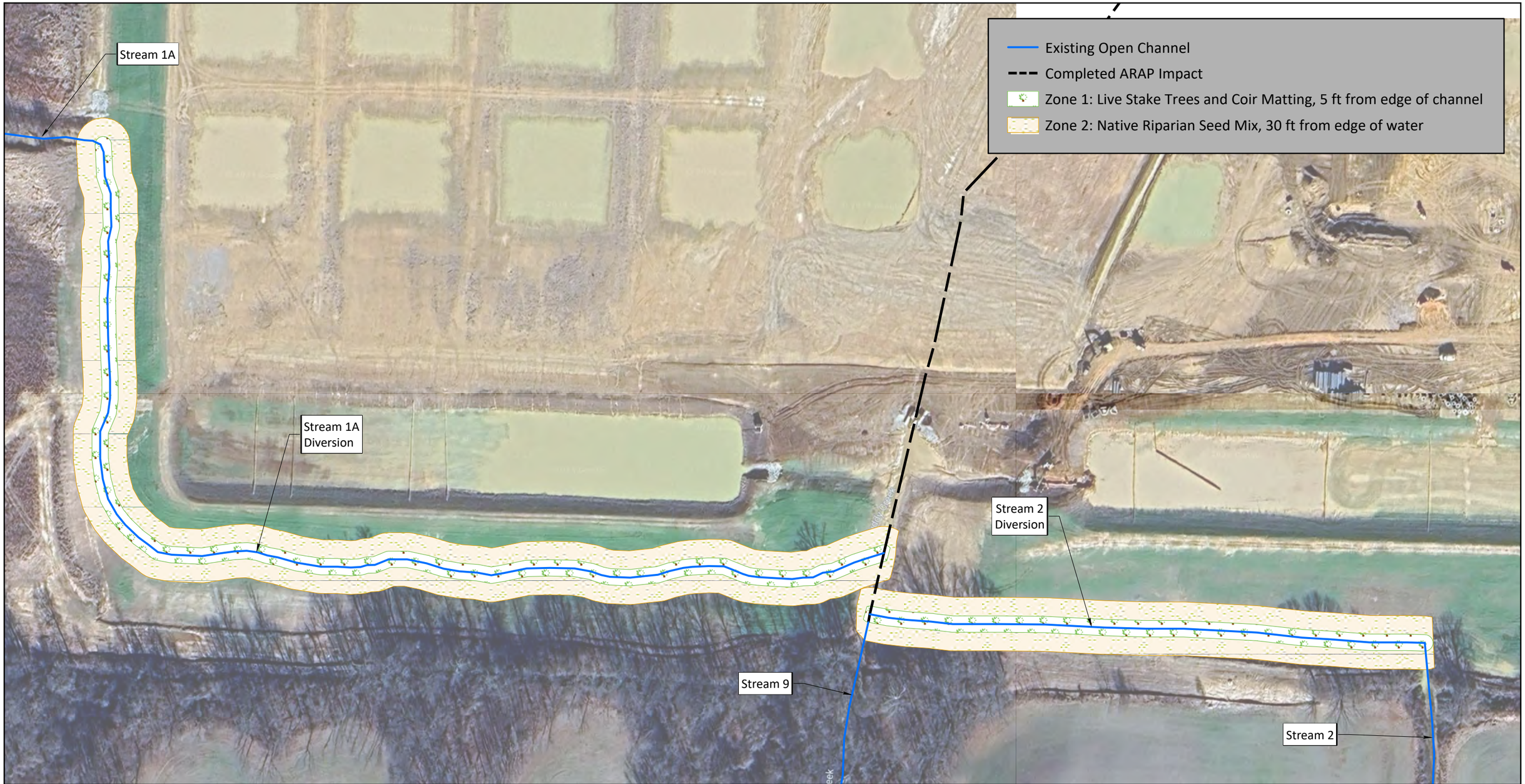
Figure 3. Stream 1-A SQT Reach Assessment Map
Ford Blue Oval
Haywood County, Tennessee

0 150 300 Feet

N

Date: 6/4/2024
NAD 1983 2011 StatePlane Tennessee FIPS 4100 Ft US
89.44741°W 35.42901°N
Prepared for: Tennessee Department of Environment and Conservation
Prepared by: Davey Resource Group
Sources: Google 2024 Aerial Imagery, Site Visit 5/15/2024.



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Nashville, TN 37203

Figure 4. Planting Layout
Ford Blue Oval
Haywood County, Tennessee

Date: 6/7/2024
NAD 1983 2011 StatePlane Tennessee FIPS 4100 Ft US
89.44475°W 35.42833°N
Prepared for: Tennessee Department of Environment and Conservation/Ford
Prepared by: Davey Resource Group
Sources: Google 2024 Aerial Imagery, Site Visit 5/15/2024.

Appendix 2: TNSQT Debit Calculator for Stream 1-A Modified Impacts

Tennessee SQT Debit Tool (Draft)

Project Name	Blue Oval City			Total Debits (FF)
Applicant	Ford Motor Company			
Project ID/Permit Number(s)	NRS21.238	Date	5/15/24	-1707.4
Project Description				

Stream ID By Reach	Impact Description	Latitude	Longitude
Stream 1-A (mod)	Channel Fill	35.42918	-89.447864
Stream 1-A (mod)	4-sided Box Culvert	35.42918	-89.447864

The Tennessee Stream Quantification Tool Credits:

Lead Agency: Tennessee Department of Environment and Conservation (TDEC)

Contributing Agencies: U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
Tennessee Interagency Review Team

Contractors:

Stream Mechanics

Ecosystem Planning and Restoration (EPR)

Version 1.3

Version Last Updated 6/9/2023

Name:
Date:

TN SQT DEBIT TOOL v1.3

Project ID/ Permit Number:	**NRS21.238**	Users Input Values	Users select values from a pull-down menu

DEBIT TOOL TABLE

Stream ID by Reach	Impact Description	Option	Existing Stream Length	Existing Condition Score	Proposed Length	Impact Severity Tier	Proposed Condition Score	Change in Functional Feet
Stream 1-A (mod)	Channel Fill	2	1210	0.66	1210	Tier 6	0.00	-798.6
Stream 1-A (mod)	4-sided Box Culvert	2	1567	0.66	1567	Tier 5	0.08	-908.8
0	0	2						
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
							Total Functional Loss (Debits in FF):	**-1707.4**

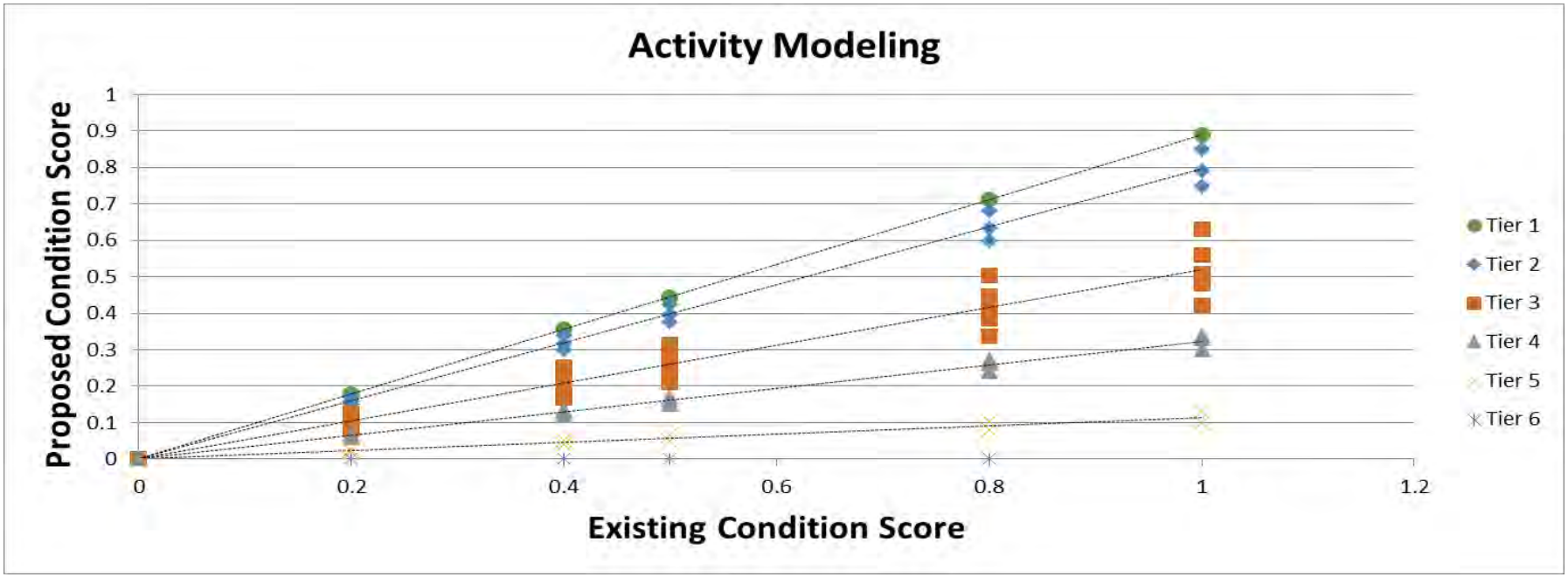
Name:
Date:

TN SQT DEBIT TOOL v1.3

Impact Severity Tiers	Impact Factors	Percent Functional Loss
Tier 0	1.00	0%
Tier 1	0.89	11%
Tier 2	0.8	20%
Tier 3	0.52	48%
Tier 4	0.32	68%
Tier 5	0.12	88%
Tier 6	0.00	100%

Proposed Impact Factors and Activity Modeling:

The graph below represents combined data from modeling individual activities and the impact these actions have on stream resources. The table has established tiers, percent functional loss and the impact factors used to determine debits. The Impact Factors were developed from linear regression equations of modeled impact scenarios using a simplified version of the SQT. Each impact type was described in detail and evaluated for stream functional loss by the proposed activities. Using a simplified SQT, an individual impact factor was developed for each impact type. These types were grouped based on % functional loss (in clusters) and graphed in "tiers". A trendline was drawn and the slope of that line became the combined impact factor representing all activities within a given tier.



Appendix 3: TNSQT Debit Calculator for Stream 1-A Modified Impacts with Revised Existing Condition Data

Tennessee SQT Debit Tool (Draft)

Project Name	Blue Oval City			Total Debits (FF)
Applicant	Ford Motor Company			
Project ID/Permit Number(s)	NRS21.238	Date	5/15/24	-1115.7
Project Description				

Stream ID By Reach	Impact Description	Latitude	Longitude
Stream 1-A (mod & rev)	Channel Fill	35.42918	-89.447864
Stream 1-A (mod & rev)	4-sided Box Culvert	35.42918	-89.447864

The Tennessee Stream Quantification Tool Credits:

Lead Agency: Tennessee Department of Environment and Conservation (TDEC)

Contributing Agencies: U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
Tennessee Interagency Review Team

Contractors:

Stream Mechanics

Ecosystem Planning and Restoration (EPR)

Version 1.3

Version Last Updated 6/9/2023

Name:
Date:

TN SQT DEBIT TOOL v1.3

Project ID/ Permit Number:	NRS21.238

Users Input Values
Users select values from a pull-down menu

DEBIT TOOL TABLE

Stream ID by Reach	Impact Description	Option	Existing Stream Length	Existing Condition Score	Proposed Length	Impact Severity Tier	Proposed Condition Score	Change in Functional Feet
Stream 1-A (mod & rev)	Channel Fill	2	1210	0.43	1210	Tier 6	0.00	-520.3
Stream 1-A (mod & rev)	4-sided Box Culvert	2	1567	0.43	1567	Tier 5	0.05	-595.4
0	0							
0	0							
0	0							
0	0							
0	0							
0	0							
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0	0							
0	0							
0	0							
Total Functional Loss (Debits in FF):								**-1115.7**

Name:
Date:

TN SQT DEBIT TOOL v1.3

Impact Severity Tiers	Impact Factors	Percent Functional Loss
Tier 0	1.00	0%
Tier 1	0.89	11%
Tier 2	0.8	20%
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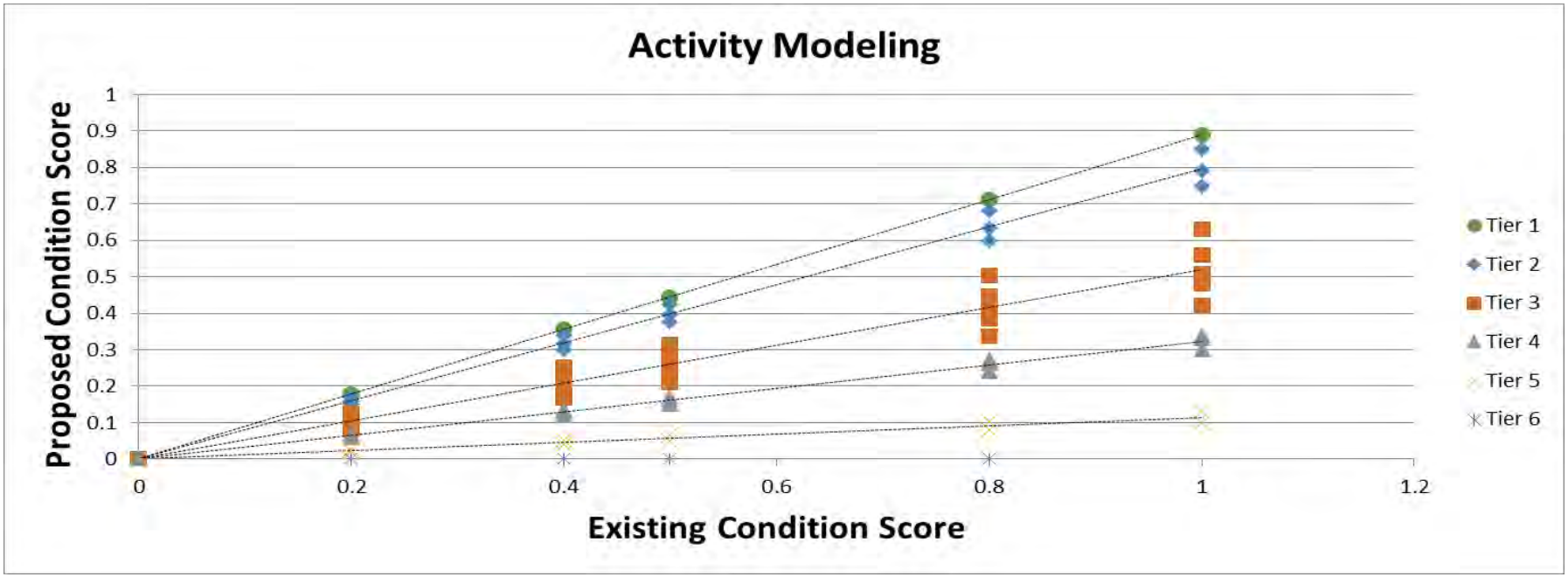
Tier 4	0.32	68%
Tier 5	0.12	88%
Tier 6	0.00	100%

Proposed Impact Factors and Activity Modeling:

The graph below represents combined data from modeling individual activities and the impact these actions have on stream resources. The table has established tiers, percent functional loss and the impact factors used to determine debits. The Impact Factors were developed from linear regression equations of modeled impact scenarios using a simplified version of the SQT. Each impact type was described in detail and evaluated for stream functional loss by the proposed activities. Using a simplified SQT, an individual impact factor was developed for each impact type. These types were grouped based on % functional loss (in clusters) and graphed in "tiers". A trendline was drawn and the slope of that line became the combined impact factor representing all activities within a given tier.



Reach Information and Reference Standard Stratification

Reach ID:	Stream 1-A (upstream)	Drainage Area (sqmi):	0.35	ETW/ONRW:	No	Upstream Latitude:	35.429219
Existing Stream Type:	F	Existing Bed Material:	Silt/Clay	Data Collection Season:		Upstream Longitude:	-89.448469
Reference Stream Type:	C	Existing Stream Slope (%):	0.2	Macro Collection Method:		Downstream Latitude:	35.429169
Ecoregion:	74b	Flow Type:	Perennial/Intermittent	Valley Type:	Unconfined Alluvial	Downstream Longitude:	-89.447808

EXISTING CONDITION ASSESSMENT

Roll Up Scoring

Functional Category	Function-Based Parameters	Measurement Method	Field Value	Index Value	Parameter	Category	Category	ECS
Hydrology	Catchment Hydrology	Watershed Land Use Runoff Score	0.36	0.38	0.38	0.27	Not Functioning	
	Reach Runoff	Stormwater Infiltration	0.15	0.15	0.15			
Hydraulics	Floodplain Connectivity	Bank Height Ratio	4.7	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.36	0.00				
Geomorphology	Large Woody Debris	Large Woody Debris Index	132	0.37	0.37	0.31	Functioning At Risk	0.43
		# Pieces						
	Lateral Migration	Erosion Rate (ft/yr)			0.80			
		Dominant BEHI/NBS		0.80				
		Percent Streambank Erosion (%)		0.80				
		Percent Armoring (%)		0.80				
	Riparian Vegetation	Left - Average Diameter at Breast Height (DBH; in)	0	0.00	0.17			
		Right - Average DBH (in)	0	0.00				
		Left - Buffer Width (feet)	0	0.00				
		Right - Buffer Width (feet)	0	0.00				
		Left - Tree Density (#/acre)	0	0.00				
		Right - Tree Density (#/acre)	0	0.00				
		Left - Native Herbaceous Cover (%)	80	1.00				
		Right - Native Herbaceous Cover (%)	40	0.53				
		Left - Native Shrub Cover (%)	10	0.14				
		Right - Native Shrub Cover (%)	0	0.00				
	Bed Material Characterization	Size Class Pebble Count Analyzer (p-value)						
	Bed Form Diversity	Pool Spacing Ratio	2.7	0.59	0.20			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	55	0.00				
		Aggradation Ratio						
	Plan Form	Sinuosity	1.01	0.00	0.00			
Physicochemical	Bacteria	E. Coli (Cfu/100 mL)		0.80	0.80	0.80	Functioning	
	Organic Enrichment	Percent Nutrient Tolerant Macroinvertebrates (%)						
	Nitrogen	Nitrate-Nitrite (mg/L)		0.80	0.80			
	Phosphorus	Total Phosphorus (mg/L)		0.80	0.80			
Biology	Macroinvertebrates	Tennessee Macroinvertebrate Index		0.80	0.80	0.80	Functioning	
		Percent Clingers (%)						
		Percent EPT - Cheumatopsyche (%)						
		Percent Oligochaeta and Chironomidae (%)						
	Fish	Native Fish Score Index						
		Catch per Unit Effort Score						

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

I. Reach Information and Stratification

Project Name:	Blue Oval
Reach ID:	Stream 1-A (upstream)
Upstream Latitude:	35.429219
Upstream Longitude:	-89.448469
Downstream Latitude:	35.429169
Downstream Longitude:	-89.447808
Ecoregion:	74b
Drainage Area (sq. mi.):	0.35
Stream Reach Length (ft):	208
Flow Type:	Perennial/Intermittent
Valley Type:	Unconfined Alluvial

Shading Key
Desktop Value
Field Value
Calculation

II. Reach Walk

A.

Length of Armoring on banks (ft)		0					
Total (ft)	0.0						
Percent Armoring (%)	0%						

B.

Difference between BKF stage and WS (ft)	Describe the bankfull indicator

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

III. Bankfull Verification and Stable Riffle Cross Section

A.	Difference between BKF stage and WS (ft) *Average or consensus value from reach walk.*	NA
B.	Bankfull Width (ft)	10.43
C.	Bankfull Mean Depth (ft) = Average of depth measurements	1.0
D.	Bankfull Area (sq. ft.) Width * Mean Depth	10.3
E.	Regional Curve Bankfull Width (ft)	11.24
F.	Regional Curve Bankfull Mean Depth (ft)	0.92
G.	Regional Curve Bankfull Area (sq. ft.)	10.35
H.	Curve Used	74b

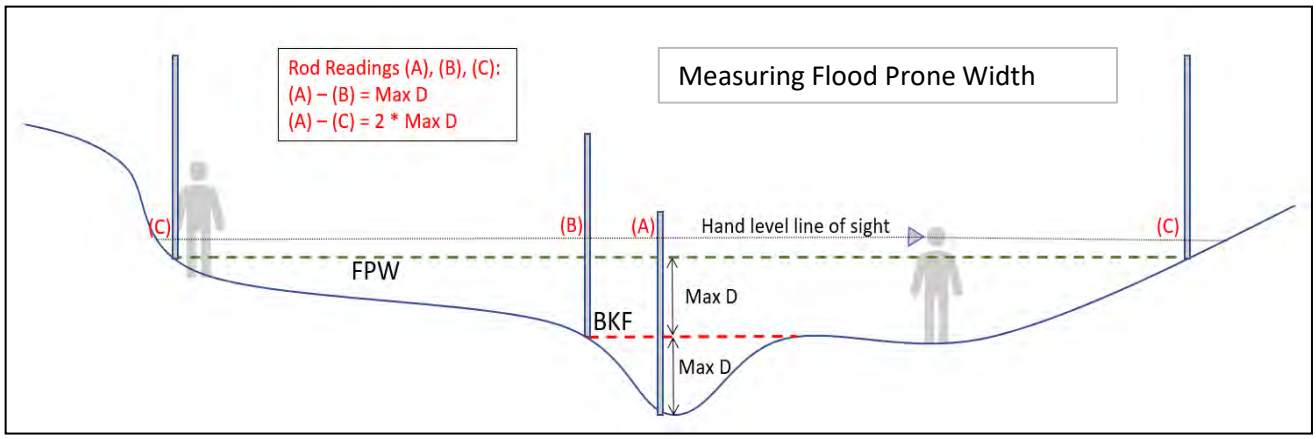
I.	Flood Prone Width (FPW; ft)	14.15
J.	Entrenchment Ratio (ER)	1.4
K.	Width Depth Ratio (WDR)	10.6
L.	Stream Type	F

Cross Section Measurements
Depth measured from bankfull

Station	Depth	Station	Depth
19.7	0		
20.5	1.15		
23	1.44		
25.5	1.09		
28	0.9		
30	0.09		

Quick Rosgen Stream Classification Guide (Rosgen, 1996)				
ER < 1.4		1.4 < ER < 2.2	ER > 2.2	
WDR < 12	WDR > 12	WDR > 12	WDR < 12	WDR > 12
A or G	F	B	E	C

Rosgen, D.L., 1996. Applied River Morphology, Wildland Hydrology Books, Pagosa Springs, Colorado.



Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

IV. Riffle Data (Floodplain Connectivity & Bed Form Diversity)

A.

Assessment Segment Length At least 20 x the Bankfull Width	208		20*Bankfull Width	208.6

B. Bank Height & Riffle Data

	R1	R2	R3	R4	R5	R6	R7	R8
Begin Station (Distance along tape)	0	69	167					
End Station (Distance along tape)	30	120	200					
Low Bank Height (ft)		6.76						
Bankfull Max Depth (ft)		1.44						
Bankfull Width (ft)		10.43						
Flood Prone Width (ft)		14.15						
Bankfull Mean Depth (ft)		1						
Riffle Length (ft) *Including Run*	30	51	33					
Bank Height Ratio (BHR) Low Bank H / BKF Max D		4.7						
BHR * Riffle Length (ft)		239.4						
Entrenchment Ratio (ER)		1.4						
ER * Riffle Length (ft)		69.2						
WDR BKF Width / BKF Mean D		10.4						

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TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

IV. Riffle Data (Continued)

C.	Total Riffle Length (ft)	114.0
D.	**Weighted BHR** $\frac{\Sigma(Bank\ Height\ Ratio_i \times \text{Riffle Length}_i)}{\Sigma Riffle\ Length}$	2.1
E.	**Weighted ER**	0.6
F.	**Maximum WDR**	10.4
G.	**Percent Riffle (%)**	55%

RiverMorph Stable XS Data

BHR	4.7
ER	1.36
WDR	10.54

V. Slope

A.

	Begin	End	Difference	Slope (ft/ft)
Station along tape (ft)	30	200	170.0	0.002
Stadia Rod Reading (ft)	87.8	88.2	0.4	

VI. Stream Type Classification

		Assessment Segment
A.	Entrenchment Ratio (ft/ft)	1.4
B.	Width Depth Ratio (ft/ft)	10.6
C.	Channel Material Estimate	silt/clay
D.	Stream Type (Rosgen, 1996)	F

VII. Pool Data (Bed Form Diversity)

A.

	P1	P2	P3	P4	P5	P6	P7	P8
Geomorphic Pool?								
Station At maximum pool depth	50	132						
P-P Spacing (ft)	X							
Pool Spacing Ratio Pool Spacing / BKF Width	X							
Pool Depth (ft) Measured from Bankfull	2.95	2.3						
Pool Depth Ratio Pool depth/BKF mean D	3.0	2.3						

B.

Average Pool Depth Ratio	2.7

C.

Median Pool Spacing Ratio	

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

VIII. Large Woody Debris

A.	Number of Pieces per 100m	LWDI method used (Score: 132)

IX. Lateral Migration

A. Bank Data

BEHI/NBS Score	Bank Length (ft)	BEHI/NBS Score	Bank Length (ft)

B.	Dominant BEHI/NBS Score	
C.	Total Eroding Bank Length (ft)	
D.	Total Bank Length (ft)	416.0
E.	Percent Streambank Erosion (%) Total Eroding Bank Length/ Total Bank Length	0%

*could not assess BEHI because of impounded water, bankfull was below water surface, default index value will be used

X. Riparian Vegetation

A.

Buffer Width	Buffer Width Measurements (ft)							Avg.
	1	2	3	4	5	6	7	
Left (looking downstream)	0							0.0
Right (looking downstream)	0							0.0

XI. Sinuosity

A.	Stream Length (ft)	694
B.	Valley Length (ft)	688.0
C.	Sinuosity	1.01

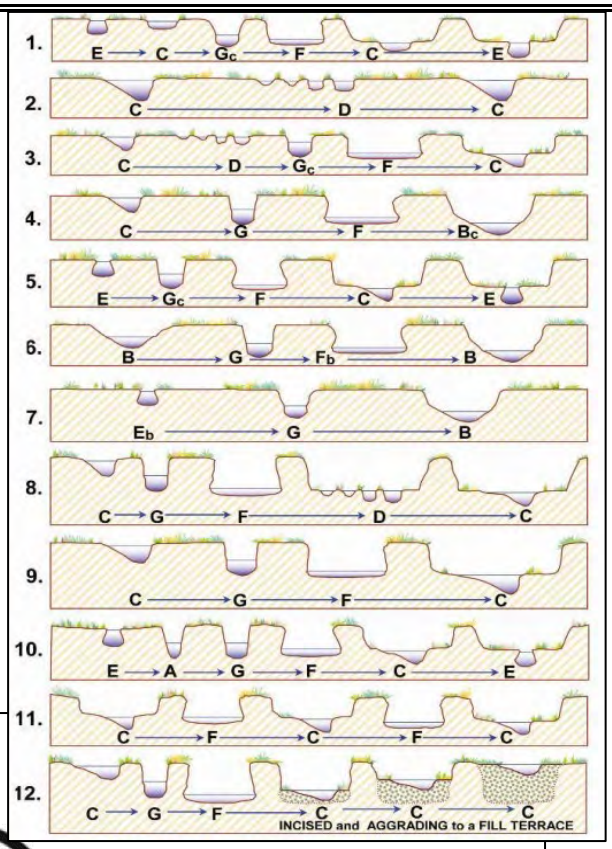
TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

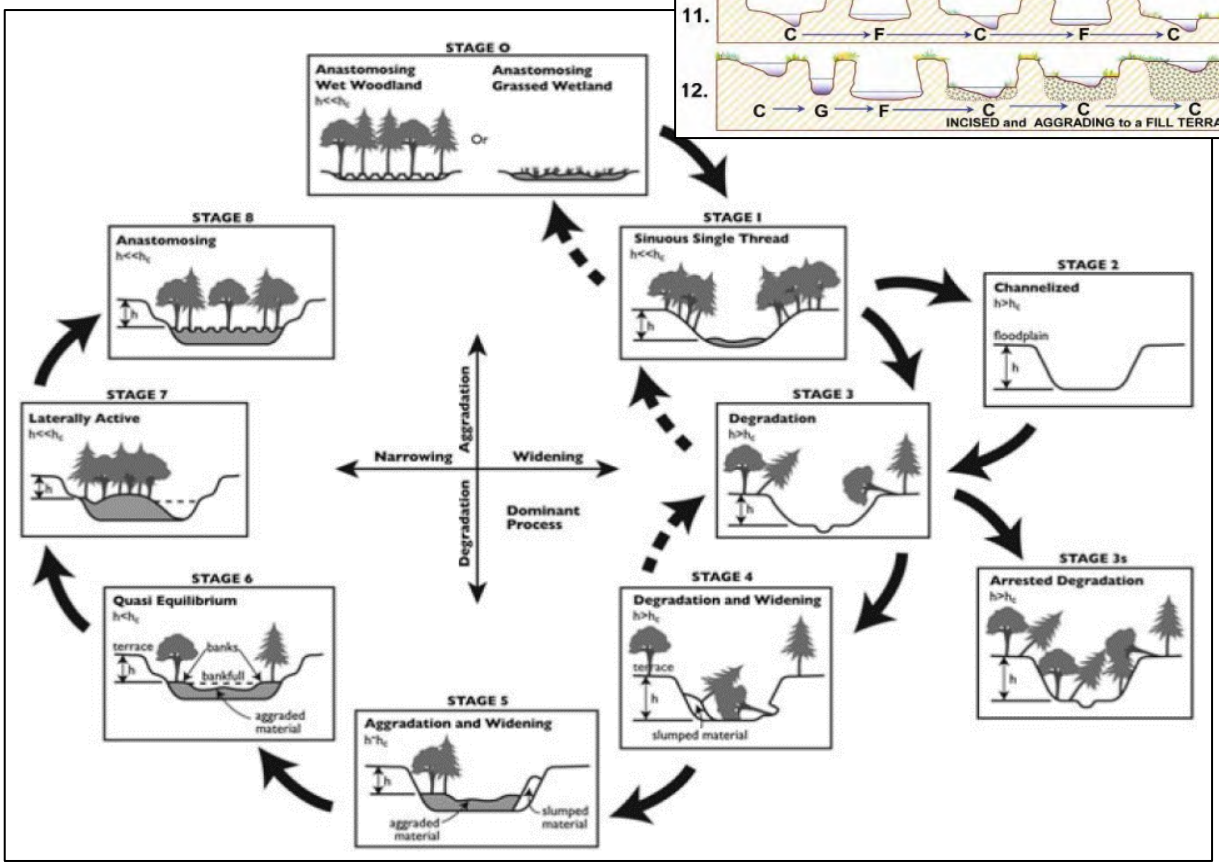
XII. Channel Evolution

A.	Rosgen Channel Type Succession	
	Simon Channel Evolution Model (Stage)	

Rosgen Channel Type



Stream Evolution Model



1 *Figure 7-48, Watershed Assessment of River Stability and Sediment Supply (WARSSS),* by David L. Rosgen, Wildland Hydrology, 2009, p. 7-175.

2 B. Cluer, C. Thorne. "A Stream Evolution Model Integrating Habitat and Ecosystem Benefits." *River Research and Applications.* 2013.

Date: 5/15/24

Investigators: CLH, GMR

TN SQT and Debit Tool
BEHI/NBS Field Form

Reach ID: STR 1-A

Valley Type: Unconfined Alluvial

Bed Material: silt/clay

			Bank Erosion Hazard Index (BEHI)									
Station ID	Bank Length (Ft)	Study Bank Height (ft)	BKF Height (ft)	Root Depth (ft)	Root Density (%)	Bank Angle (degrees)	Surface Protection (%)	Bank Material Adjustment	Stratification Adjustment	BEHI Total/ Category	NBS Ranking	Notes
	No BEHI data was collected due to the impounded waters, BKF was below water surface											

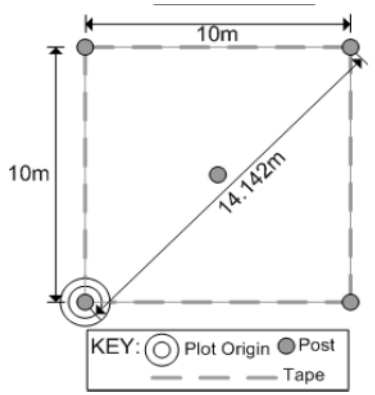
Date: 5/15/24
Investigators: GMR, CLH
Project Name: Blue Oval

TN SQT and Debit Tool
Riparian Vegetation Rapid Plots

Plot ID	Native Cover		Saplings DBH (cm)		Trees DBH (cm)								
	Herbaceous Strata	Shrub Strata	0 - 1	1 - 2.5	2.5 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	≥40
LDB STR 1-A	80	10											
Latitude: Long:			Notes: All trees were observed within the banks of the channel and were not counted.										
RDB STR 1-A	40	0											
Latitude: Long:			Notes: All trees were observed within the banks of the channel and were not counted.										
Latitude: Long:			Notes:										
Latitude: Long:			Notes:										

Strata	Height Range (m)	Description
Herb	0-1	Can also include shrubs within height class
Shrub	1 to 5	Shrubs only, no tree saplings

Tally Method						
	= 1	= 2	= 3	= 4	= 5	= 6
	= 7	= 8	= 9	= 10	= 11	= 12, etc.



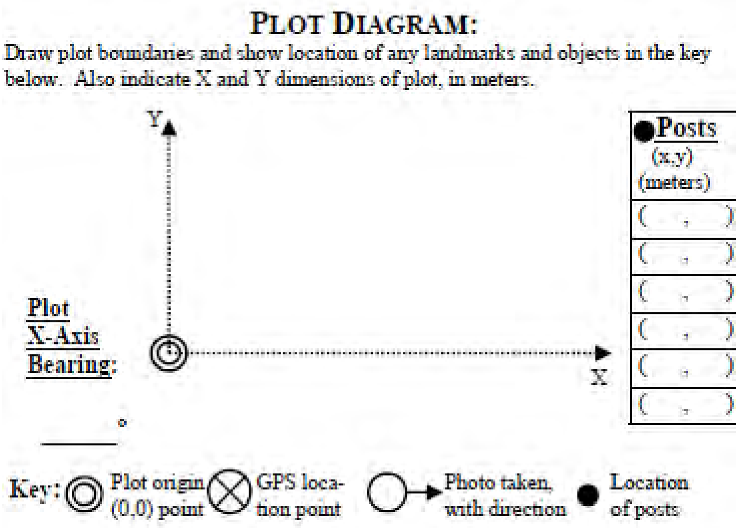
Note: Latitude and Longitude should be recorded for the point of origin (double circle) fro each plot in decimal degrees

Data forms and protocol are modified from the Carolina Vegetation Survey (CVS) protocol (Lee et al. 2008)
Plot IDs must correspond to plots indentified on a map of the project area.

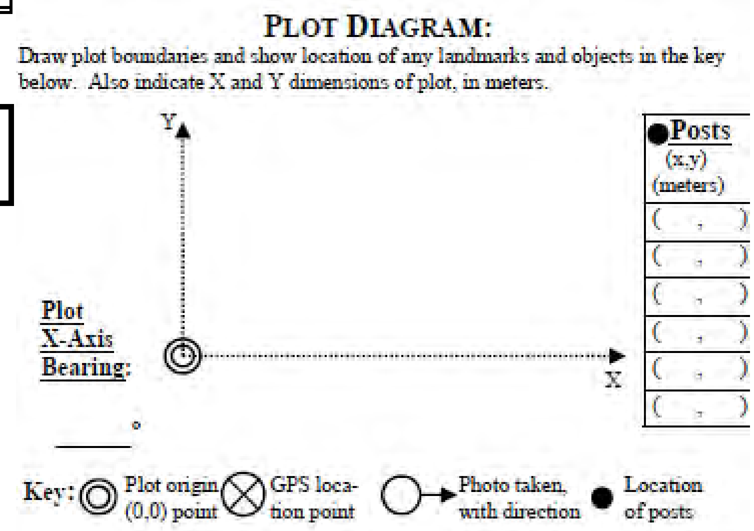
Date: 5/15/24
Investigators: GMR, CLH
Project Name: Blue Oval

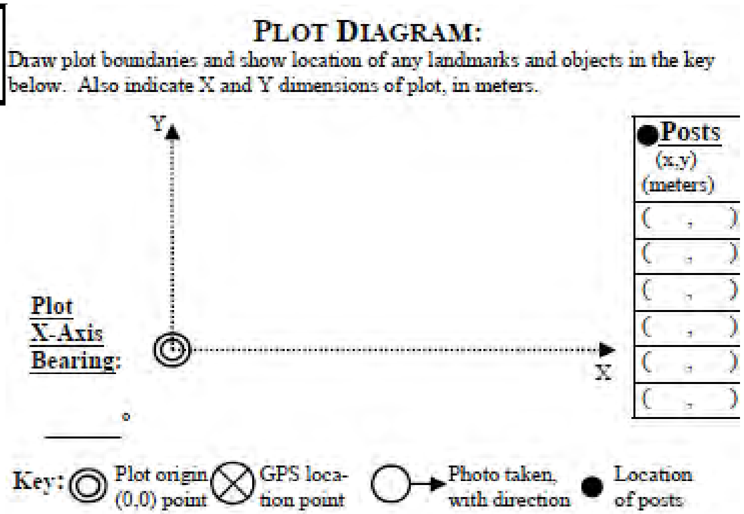
TN SQT and Debit Tool
Riparian Vegetation Rapid Plots

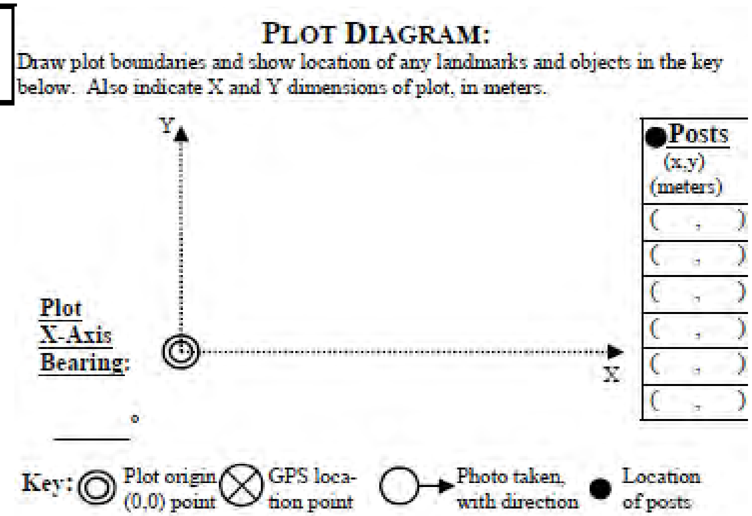
Plot ID



Plot ID







Data forms and protocol are modified from the Carolina Vegetation Survey (CVS) protocol (Lee et al. 2008)
Plot IDs must correspond to plots indentified on a map of the project area.

Appendix 4: TNSQT Existing Condition Data for Stream 1-A Diversion Channel

Reach Information and Reference Standard Stratification

Reach ID:	Stream 1-A Diversion	Drainage Area (sqmi):	0.35	ETW/ONRW:		Upstream Latitude:	35.428809
Existing Stream Type:	B	Existing Bed Material:	Silt/Clay	Data Collection Season:		Upstream Longitude:	-89.447719
Reference Stream Type:	C	Existing Stream Slope (%):	0.5	Macro Collection Method:		Downstream Latitude:	35.428151
Ecoregion:	74b	Flow Type:	Perennial/Intermittent	Valley Type:	Unconfined Alluvial	Downstream Longitude:	-89.44717

EXISTING CONDITION ASSESSMENT

Roll Up Scoring

Functional Category	Function-Based Parameters	Measurement Method	Field Value	Index Value	Parameter	Category	Category	ECS
Hydrology	Catchment Hydrology	Watershed Land Use Runoff Score	0.36	0.38	0.38	0.27	Not Functioning	
	Reach Runoff	Stormwater Infiltration	0.15	0.15	0.15			
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.5	0.31	0.16	0.16	Not Functioning	
		Entrenchment Ratio	1.54	0.00				
Geomorphology	Large Woody Debris	Large Woody Debris Index	0	0.00	0.00	0.16	Not Functioning	0.43
		# Pieces						
	Lateral Migration	Erosion Rate (ft/yr)			0.80			
		Dominant BEHI/NBS		0.80				
		Percent Streambank Erosion (%)		0.80				
		Percent Armoring (%)		0.80				
	Riparian Vegetation	Left - Average Diameter at Breast Height (DBH; in)	0	0.00	0.00			
		Right - Average DBH (in)	0	0.00				
		Left - Buffer Width (feet)	0	0.00				
		Right - Buffer Width (feet)	0	0.00				
		Left - Tree Density (#/acre)	0	0.00				
		Right - Tree Density (#/acre)	0	0.00				
		Left - Native Herbaceous Cover (%)	0	0.00				
		Right - Native Herbaceous Cover (%)	0	0.00				
		Left - Native Shrub Cover (%)	0	0.00				
		Right - Native Shrub Cover (%)	0	0.00				
	Bed Material Characterization	Size Class Pebble Count Analyzer (p-value)						
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	100	0.00				
		Aggradation Ratio						
	Plan Form	Sinuosity	1.03	0.00	0.00			
Physicochemical	Bacteria	E. Coli (Cfu/100 mL)		0.80	0.80	0.80	Functioning	
	Organic Enrichment	Percent Nutrient Tolerant Macroinvertebrates (%)						
	Nitrogen	Nitrate-Nitrite (mg/L)		0.80	0.80			
	Phosphorus	Total Phosphorus (mg/L)		0.80	0.80			
Biology	Macroinvertebrates	Tennessee Macroinvertebrate Index		0.80	0.80	0.80	Functioning	
		Percent Clingers (%)						
		Percent EPT - Cheumatopsyche (%)						
		Percent Oligochaeta and Chironomidae (%)						
	Fish	Native Fish Score Index						
		Catch per Unit Effort Score						

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

I. Reach Information and Stratification

Project Name:	Blue Oval
Reach ID:	Stream 1-A Diversion
Upstream Latitude:	35.428809
Upstream Longitude:	-89.447719
Downstream Latitude:	35.428151
Downstream Longitude:	-89.447717
Ecoregion:	74b
Drainage Area (sq. mi.):	0.35
Stream Reach Length (ft):	252
Flow Type:	Perennial/Intermittent
Valley Type:	Unconfined Alluvial

Shading Key
Desktop Value
Field Value
Calculation

II. Reach Walk

A.

Length of Armoring on banks (ft)		0					
Total (ft)	0.0						
Percent Armoring (%)	0%						

B.

Difference between BKF stage and WS (ft)	Describe the bankfull indicator

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

III. Bankfull Verification and Stable Riffle Cross Section

A.	Difference between BKF stage and WS (ft) *Average or consensus value from reach walk.*	0.825
B.	Bankfull Width (ft)	19.2
C.	Bankfull Mean Depth (ft) = Average of depth measurements	0.5
D.	Bankfull Area (sq. ft.) Width * Mean Depth	9.9
E.	Regional Curve Bankfull Width (ft)	11.24
F.	Regional Curve Bankfull Mean Depth (ft)	0.92
G.	Regional Curve Bankfull Area (sq. ft.)	10.35
H.	Curve Used	74

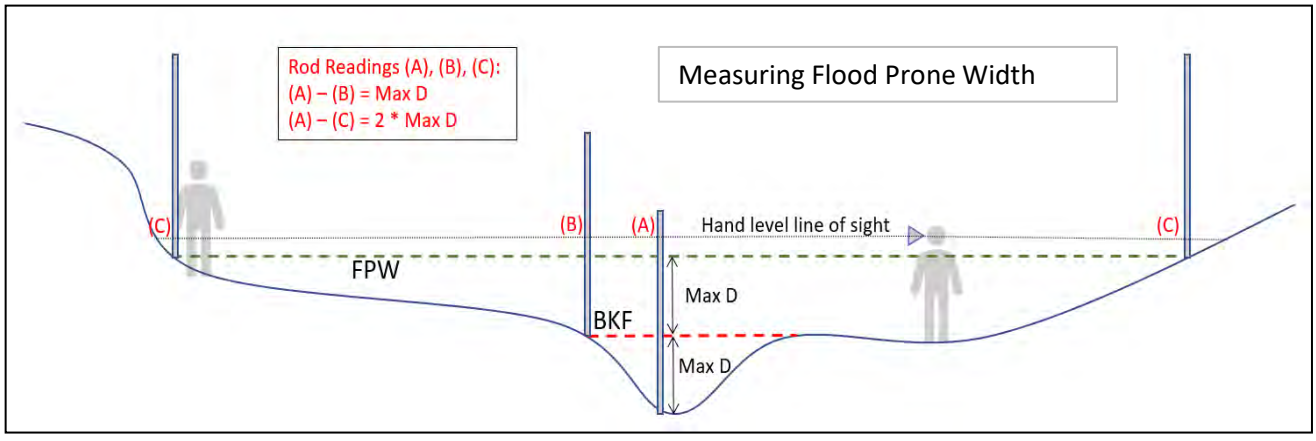
I.	Flood Prone Width (FPW; ft)	29.8
J.	Entrenchment Ratio (ER)	1.6
K.	Width Depth Ratio (WDR)	37.2
L.	Stream Type	B

Cross Section Measurements
Depth measured from bankfull

Station	Depth	Station	Depth
11.2	0	24	0.72
12	0.12	25.5	0.62
14.5	0.24	26.2	0.53
15	0.6	26.7	0.27
15.7	0.8	28	0.2
16.5	0.8		
17.5	0.84		
18.5	0.83		
20.5	0.82		
21.5	0.83		
22.5	0.86		
23	0.82		

Quick Rosgen Stream Classification Guide (Rosgen, 1996)				
ER < 1.4		1.4 < ER < 2.2	ER > 2.2	
WDR < 12	WDR > 12	WDR > 12	WDR < 12	WDR > 12
A or G	F	B	E	C

Rosgen, D.L., 1996. Applied River Morphology, Wildland Hydrology Books, Pagosa Springs, Colorado.



Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

IV. Riffle Data (Floodplain Connectivity & Bed Form Diversity)

A.

Assessment Segment Length At least 20 x the Bankfull Width	252		20*Bankfull Width	384.0

B. Bank Height & Riffle Data

	R1	R2	R3	R4	R5	R6	R7	R8
Begin Station (Distance along tape)	0							
End Station (Distance along tape)	252							
Low Bank Height (ft)	1.25							
Bankfull Max Depth (ft)	0.86							
Bankfull Width (ft)	19.2							
Flood Prone Width (ft)	29.8							
Bankfull Mean Depth (ft)	0.5							
Riffle Length (ft) *Including Run*	252							
Bank Height Ratio (BHR) Low Bank H / BKF Max D	1.5							
BHR * Riffle Length (ft)	366.3							
Entrenchment Ratio (ER)	1.6							
ER * Riffle Length (ft)	391.1							
WDR BKF Width / BKF Mean D	38.4							

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

IV. Riffle Data (Continued)

C.	Total Riffle Length (ft)	252.0
D.	**Weighted BHR** $\frac{\Sigma(Bank\ Height\ Ratio_i \times \text{Riffle Length}_i)}{\Sigma Riffle\ Length}$	1.5
E.	**Weighted ER**	1.6
F.	**Maximum WDR**	38.4
G.	**Percent Riffle (%)**	100%

RiverMorph Stable XS Data

BHR	1.5
ER	1.54
WDR	37.3

V. Slope

A.

	Begin	End	Difference	Slope (ft/ft)
Station along tape (ft)	0	228	228.0	0.005
Stadia Rod Reading (ft)	93.2	92.2	1.0	

VI. Stream Type Classification

		Assessment Segment
A.	Entrenchment Ratio (ft/ft)	1.5
B.	Width Depth Ratio (ft/ft)	38.4
C.	Channel Material Estimate	silt/clay
D.	Stream Type (Rosgen, 1996)	B

VII. Pool Data (Bed Form Diversity)

A.

	P1	P2	P3	P4	P5	P6	P7	P8
Geomorphic Pool?								
Station At maximum pool depth								
P-P Spacing (ft)	X							
Pool Spacing Ratio Pool Spacing / BKF Width	X							
Pool Depth (ft) Measured from Bankfull								
Pool Depth Ratio Pool depth/BKF mean D								

B.	Average Pool Depth Ratio		C.	Median Pool Spacing Ratio	

Date: 5/15/24
Inv: CLH, GMR

TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

VIII. Large Woody Debris

A.	Number of Pieces per 100m	LWDI method used (Score: 0)

IX. Lateral Migration

A. Bank Data

BEHI/NBS Score	Bank Length (ft)	BEHI/NBS Score	Bank Length (ft)

B.	Dominant BEHI/NBS Score	
C.	Total Eroding Bank Length (ft)	
D.	Total Bank Length (ft)	504.0
E.	Percent Streambank Erosion (%) Total Eroding Bank Length/ Total Bank Length	0%

*did not assess BEHI because it was not assessed on Stream 1-A, will use default value for more accurate comparison

X. Riparian Vegetation

A.

Buffer Width	Buffer Width Measurements (ft)							Avg.
	1	2	3	4	5	6	7	
Left (looking downstream)	0							0.0
Right (looking downstream)	0							0.0

XI. Sinuosity

A.	Stream Length (ft)	1041
B.	Valley Length (ft)	1010.0
C.	Sinuosity	1.03

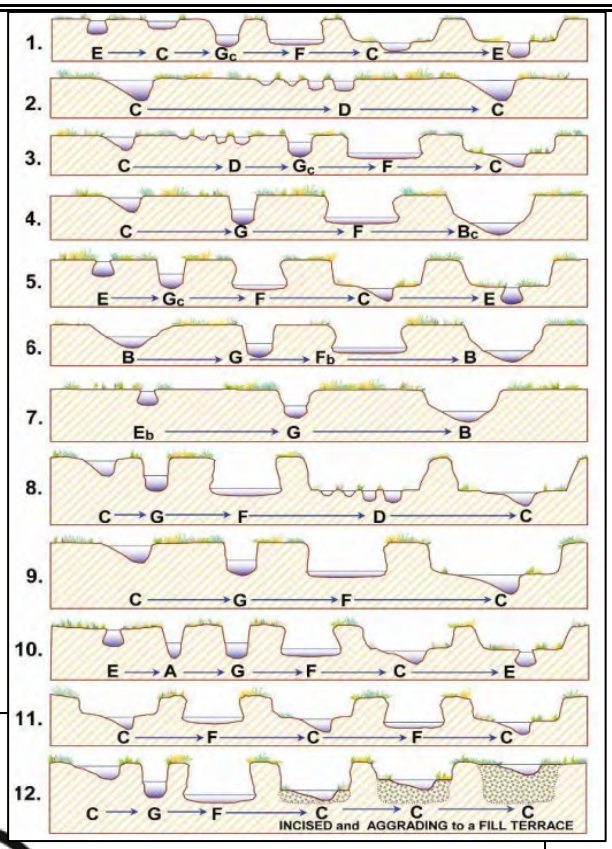
TN SQT and Debit Tool Rapid Assessment Form

Version 1.2 January 2020

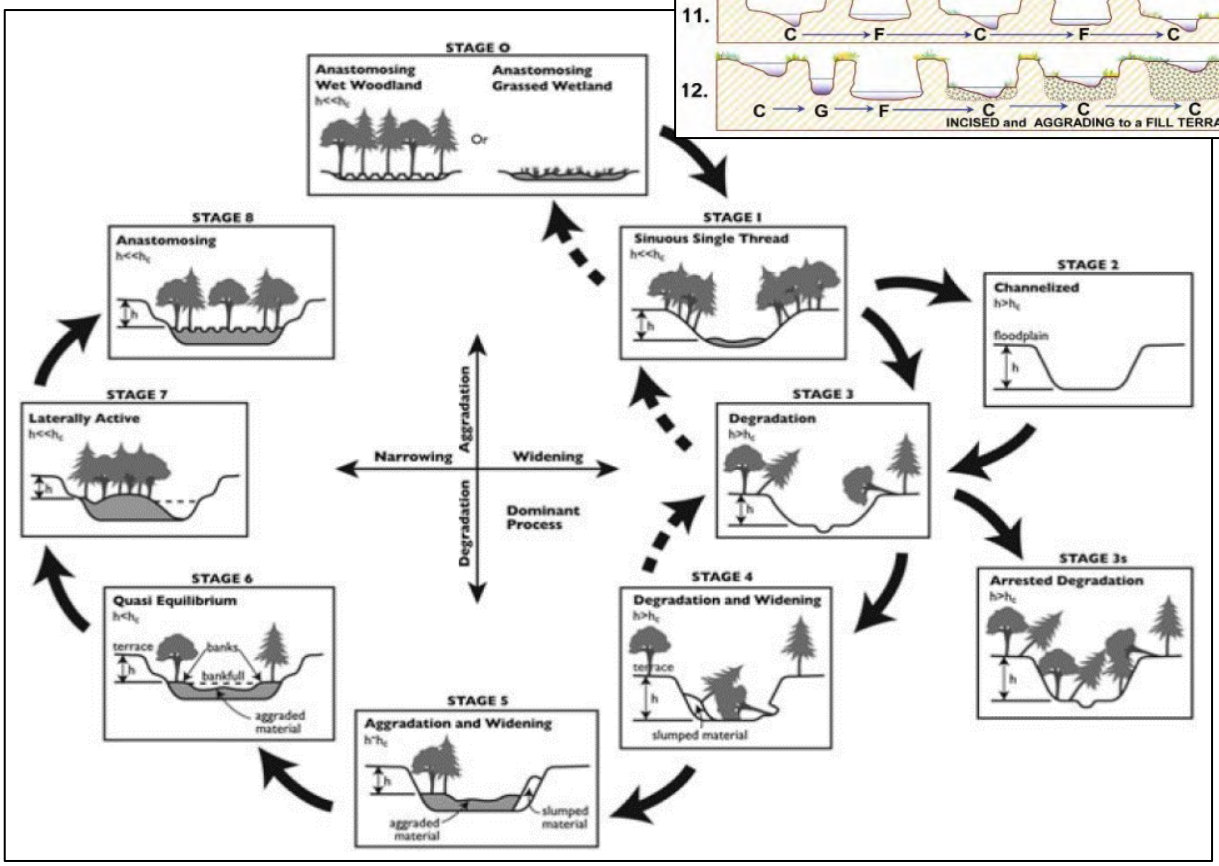
XII. Channel Evolution

A.	Rosgen Channel Type Succession	
	Simon Channel Evolution Model (Stage)	

Rosgen Channel Type



Stream Evolution Model



1 *Figure 7-48, Watershed Assessment of River Stability and Sediment Supply (WARSSS),* by David L. Rosgen, Wildland Hydrology, 2009, p. 7-175.

2 B. Cluer, C. Thorne. "A Stream Evolution Model Integrating Habitat and Ecosystem Benefits." *River Research and Applications.* 2013.

Date: 5/15/24

Investigators: CLH, GMR

TN SQT and Debit Tool
BEHI/NBS Field Form

Reach ID: STR 1-A Diversion

Valley Type: Unconfined Alluvial

Bed Material: silt/clay

			Bank Erosion Hazard Index (BEHI)									
Station ID	Bank Length (Ft)	Study Bank Height (ft)	BKF Height (ft)	Root Depth (ft)	Root Density (%)	Bank Angle (degrees)	Surface Protection (%)	Bank Material Adjustment	Stratification Adjustment	BEHI Total/ Category	NBS Ranking	Notes
	No BEHI data was collected because it was not collected on STR 1-A, will use default value											

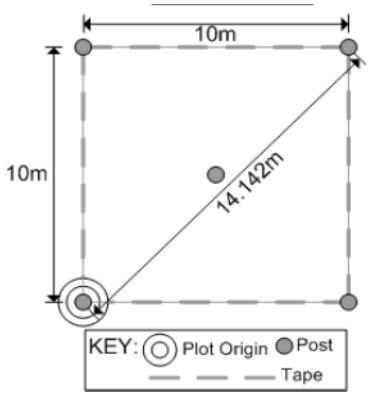
Date: 5/15/24
Investigators: CLH, GMR
Project Name: Blue Oval

TN SQT and Debit Tool
Riparian Vegetation Rapid Plots

Plot ID	Native Cover		Saplings DBH (cm)		Trees DBH (cm)								
	Herbaceous Strata	Shrub Strata	0 - 1	1 - 2.5	2.5 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	≥40
LDB STR 1-A Diversion	0	0											
Latitude: Long:	Notes: No trees, no shrubs, recently seeded with rye grass.												
RDB STR 1-A Diversion	0	0											
Latitude: Long:	Notes: No trees, no shrubs, recently seeded with rye grass.												
Latitude: Long:	Notes:												
Latitude: Long:	Notes:												

Strata	Height Range (m)	Description
Herb	0-1	Can also include shrubs within height class
Shrub	1 to 5	Shrubs only, no tree saplings

Tally Method						
	= 1	= 2	= 3	= 4	= 5	= 6
	= 7	= 8	= 9	= 10	= 11	= 12, etc.



Note: Latitude and Longitude should be recorded for the point of origin (double circle) fro each plot in decimal degrees

Data forms and protocol are modified from the Carolina Vegetation Survey (CVS) protocol (Lee et al. 2008)
Plot IDs must correspond to plots indentified on a map of the project area.

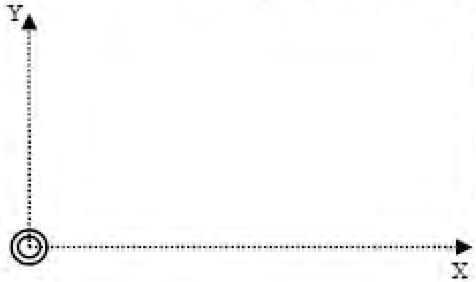
Date: 5/15/24
Investigators: CLH, GMR
Project Name: Blue Oval

TN SQT and Debit Tool
Riparian Vegetation Rapid Plots

Plot ID

PLOT DIAGRAM:

Draw plot boundaries and show location of any landmarks and objects in the key below. Also indicate X and Y dimensions of plot, in meters.



Plot X-Axis Bearing: ____ °

● Posts (x,y) (meters)
(,)
(,)
(,)
(,)
(,)
(,)

Key: ◎ Plot origin (0,0) point ⊗ GPS location point ○→ Photo taken, with direction ● Location of posts

Plot ID

PLOT DIAGRAM:

Draw plot boundaries and show location of any landmarks and objects in the key below. Also indicate X and Y dimensions of plot, in meters.

Plot X-Axis Bearing: ____ °

● Posts (x,y) (meters)
(,)
(,)
(,)
(,)
(,)
(,)

Key: ◎ Plot origin (0,0) point ⊗ GPS location point ○→ Photo taken, with direction ● Location of posts

PLOT DIAGRAM:

Draw plot boundaries and show location of any landmarks and objects in the key below. Also indicate X and Y dimensions of plot, in meters.

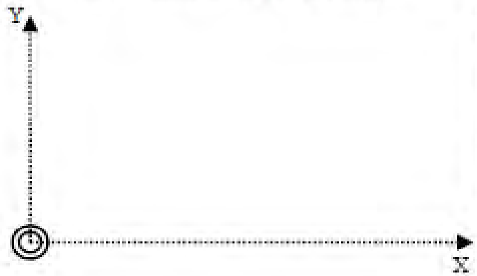
Plot X-Axis Bearing: ____ °

● Posts (x,y) (meters)
(,)
(,)
(,)
(,)
(,)
(,)

Key: ◎ Plot origin (0,0) point ⊗ GPS location point ○→ Photo taken, with direction ● Location of posts

PLOT DIAGRAM:

Draw plot boundaries and show location of any landmarks and objects in the key below. Also indicate X and Y dimensions of plot, in meters.



Plot X-Axis Bearing: ____ °

● Posts (x,y) (meters)
(,)
(,)
(,)
(,)
(,)
(,)

Key: ◎ Plot origin (0,0) point ⊗ GPS location point ○→ Photo taken, with direction ● Location of posts

Data forms and protocol are modified from the Carolina Vegetation Survey (CVS) protocol (Lee et al. 2008)
Plot IDs must correspond to plots indentified on a map of the project area.

Appendix 5: Planting Plan

Appendix 5: Stream 1A and Stream 2 Planting Plan

The planting plan utilizes a mix of native live-stake trees, grasses, and perennials typically found in Ecoregion 74b, Loess Plains. The planting plan comprises 2 specific zones, described below.

- *Zone 1:* The immediate riparian zone extending to approximately 5 feet from the stream bank. Zone 1 will comprise native tree live stakes from the Planting Zone 1 species list. Live stakes will be planted in a 3ft x 3 ft spacing arrangement. For Stream 1A, 4800 live stakes will be planted, and 2,250 live stakes will be planted for Stream 2.
- *Zone 2:* Extends approximately 30ft from the edge of water and covers approximately 0.73 acres for Stream 1-A and 0.34 acres for Stream 2. Zone 2 will comprise a riparian seed mix of native grasses and perennials, planted at a rate of 7.2 lbs/acre.

Within Zone 1, live stake vegetation will be installed into the stream banks to provide stability. Species will consist of, but not be limited to, black willow (*Salix nigra*) and buttonbush (*Cephalanthus occidentalis)*. The stakes will be planted in a 3ft x 3ft spacing pattern on either bank. Suitable coir fiber matting will be installed along the constructed stream banks in accordance with ARAP Special Condition #7.

Overseeding with perennial or annual herbaceous species will occur in Zone 2. Perennial herbaceous species represented in the seed mix will all be native to the ecoregion. These areas will be mulched with up to 1 to 2 tons of straw per acre and soil amendments where necessary.

The plantings will be monitored for three-years to document bank stability and overall success of the newly planted riparian buffer. If either bank stability or vegetative survivability is not meeting the expected standards, then recommendations will be made to address and correct any deficiencies.

Zone 1 Planting Quantities and Species

STREAM 1-A Diversion ZONE 1: 3ft X 3ft Spacing				
COMMON NAME	**SCIENTIFIC NAME**	**PLANTING TYPE**	**COMPOSITION (%)**	**TOTAL STEMS**
BLACK WILLOW	*Salix nigra*	**Live Stake**	50	2400
BUTTONBUSH	*Cephalanthus occidentalis*	**Live Stake**	50	2400
			Total	**4800**

Stream 2 Diversion ZONE 1: 3ft X 3ft Spacing				
COMMON NAME	**SCIENTIFIC NAME**	**PLANTING TYPE**	**COMPOSITION (%)**	**TOTAL STEMS**
BLACK WILLOW	*Salix nigra*	**Live Stake**	50	1125
BUTTONBUSH	*Cephalanthus occidentalis*	**Live Stake**	50	1125
			Total	**2250**

Note: Within Zone 1, suitable coir fiber matting will be installed along the constructed stream banks in accordance with ARAP Special Condition #7.

Zone 2 Planting Quantities and Species

Riparian Seed Mix	Type	Acres	Rate (lbs/ac)	Quantity (lbs)
Stream 1-A_Diverison	Seed	0.73	7.2	5.256
Stream 2_Diversion	Seed	0.34	7.2	2.448

PERMANENT SEED MIX – ROUNDSTONE SOUTHERN RIPARIAN MIX - 168					
Common Name	***Botanical Name***	***PLS Oz.***	***Common Name***	***Botanical Name***	***PLS Oz.***
Virginia Wild Rye	*Elymus virginicus*	*2.40*	*Bergamot*	*Monarda fistulosa*	*0.10*
Barnyard Grass	*Echinochloa muricata*	*0.50*	*Cup Plant*	*Silphium perfoliatum*	*1.00*
Upland Bentgrass	*Agrostis perennans*	*0.02*	*Showy Tickseed*	*Bidens aristosa*	*0.60*
Big Bluestem	*Andropogon gerardii*	*1.40*	*Joe-Pye Weed*	*Eupatorium fistulosum*	*0.20*
Deer Tongue Grass	*Panicum clandestinum*	*1.40*	*Sneezeweed*	*Helenium autumnale*	*0.20*
Fall Panicum	*Panicum anceps*	*1.40*	*Yellow Wingstem*	*Verbesina alternifolia*	*0.50*
Switchgrass	*Panicum virgatum*	*2.40*	*Iron Weed*	*Vernonia altissima*	*0.40*
Fox Sedge	*Carex vulpinoidea*	*0.48*	*Narrow-Leaved Sunflower*	*Helianthus angustifolius*	*0.40*
Wild Senna	*Cassia marilandica*	*1.00*	*False Sunflower*	*Heliopsis helianthoides*	*0.60*
Illinois Bundleflower	*Desmanthus illinoensis*	*0.50*	*Spiked Blazing Star*	*Liatris spicata*	*0.50*

Appendix 6: Photographs

1 Confluence of Stream 9 and Stream 2 Diversion, facing upstream and to the south

2 Confluence of Stream 9 and Stream 2 Diversion, facing downstream and to the north

3 Stream 9 permitted impact (channelized reach), facing upstream and to the south

4 Stream 9 permitted impacts (chanelized reach and encapsulation), facing downstream and to the north

5 Stream 9 permitted impact (encapsulation), facing downstream and to the north

6 Stream 9 permitted impact (channelized reach), facing upstream and to the south

7 Stream 9 permitted impact (channelized reach), facing upstream and to the south

8 Stream 9 permitted impact (encapsulation), facing downstream and to the north

9 Start of Stream 2 Diversion, looking upstream, and to the south

10 Start point of Stream 2 Diversion, looking downstream and to the west

11 Stream 2 Diversion, looking upstream and to the east

12 Stream 2 Diversion, looking downstream and to the west

13 Stream 2 Diversion, looking upstream and to the east

14 Stream 2 Diversion, looking across channel and to the south

15 Stream 2 Diversion, looking upstream and to the east

16 Stream 2 Diversion, looking downstream and to the west

17 Stream 2 Diversion, looking downstream and to the west

18 Stream 2 Diversion, looking downstream and to the west

19 Stream 2 Diversion, looking upstream and to the east

20 Stream 2 Diversion, looking downstream and to the west

21 Stream 2 Diversion, looking upstream and to the east

22 Stream 1-A Diversion confluence with Stream 9, facing downstream and to the northeast

23 Stream 1-A Diversion, facing upstream and to the west

24 Stream 1-A Diversion, facing upstream and to the west

25 Stream 1-A Diversion, facing downstream and to the east

26 Stream 1-A Diversion, facing downstream and to the east

27 Stream 1-A Diversion, facing upstream and to the west

28 Stream 1-A Diversion, facing downstream and to the south

29 Stream 1-A Diversion, facing upstream and to the north

30 Stream 1-A Diversion SQT reach start location, looking upstream

31 Stream 1-A Diversion SQT reach start location, looking downstream

32 Stream 1-A Diversion SQT vegetation plot on right descending bank

33 Stream 1-A Diversion SQT vegetation plot on left descending bank

34 Stream 1-A Diversion SQT reach end location, looking upstream

35 Stream 1-A Diversion SQT reach end location, looking downstream

36 Stream 1-A (upstream) SQT reach start location, looking upstream

37 Stream 1-A (upstream) SQT reach start location, looking downstream

38 Stream 1-A (upstream) SQT vegetation plot on right descending bank

39 Stream 1-A (upstream) SQT vegetation plot on left descending bank

40 Stream 1-A (upstream) stable cross section location

41 Stream 1-A (upstream) SQT reach end location, looking upstream

42 Stream 1-A (upstream) SQT reach end location, looking north

43 Example photo of Stream 1-A prior to impacts with vegetation removed.

Ford Motor Company
Rotunda Center
17000 Rotunda Drive
Dearborn, MI 48120

June 11, 2024

Ms. Joellyn Brazile
State of Tennessee
Department of Environment and Conservation
Memphis Environmental Field Office
Division of Water Resources
8383 Wolf Lake Drive
Bartlett, TN 38133

Subject: Follow-Up to 4-23-24 ARAP Compliance Letter – Ford Motor Company ARAP Tracking Number NRS21.238 Haywood County, Tennessee

Dear Ms. Brazile:

An ARAP Compliance Inspection Letter was issued on April 23, 2024, to Ford Blue Oval City. To respond to the required actions in the letter, Ford hired the Davey Group to complete a site assessment and prepare the attached final report.

If you have questions or require additional information, please contact Ann McCormick at 313-805-6446 or by email at amccorm3@ford.com.

Sincerely,

DocuSigned by:
Kevin Whipp Jun-11-2024
CDE67AE194FA478...

Kevin Whipp
Global Director Ford Land
Ford Motor Company