STREAM DISCHARGE DATA SHEET

Complete this data sheet and keep for your records. Data can be submitted online at mostreamteam.org.

Site # _____ Stream _____ County _____

Site Location _____

Date ____/____/____ Time (military time) _____ Rainfall (inches in last 7 days) _____ Water Temp. (°C) _____

Trained Data Submitter (responsible volunteer) _____ Stream Team Number _____

Participants _____

If discharge is unmeasurable due to conditions, please indicate: ☐ Flow too low to measure ☐ Flow too high to measure

For reporting USGS gage value (special cases only): USGS gage # _____ at _____ cfs

Instructions for Calculation of Stream Discharge (Flow)

Step 1a: Determine stream width. Select a section of stream that is relatively straight, free from large objects such as logs or large boulders, with a noticeable current, and with a depth as uniform as possible. Stretch the tape measure provided by the program across the stream. The "0" point should be anchored at the flowing edge of the stream. The end of the tape measure should be anchored at the opposite end so that it is taut and even with the other flowing edge. Do not measure nonflowing water.

☐ Stream Width (Feet)

Step 1b: Determine stream cross-sectional area. The first step in determining cross-sectional area is to measure and calculate the average stream depth. In the table below, for streams less than 20 feet wide, record depth measurements at every foot. For streams greater than 20 feet wide, record depth measurements every two feet. The depth must be measured in **tenths of a foot** (e.g. 1.7 feet equals one foot and seven tenths). **DO NOT MEASURE DEPTH IN INCHES.**

Record Depth at 1-Foot Intervals					
Interval Number	Depth in Feet	Interval Number	Depth in Feet	Interval Number	Depth in Feet
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	
Sum		Sum		Sum	

The average depth is calculated by dividing the sum of the depth measurements by the number of intervals at which measurments were taken.

☐ Sum of Depths (feet) ÷ ☐ Number of Intervals = ☐ Average Depth (feet)

The final step in calculating the cross-sectional area is multiply the average depth (in feet) by the stream width (in feet) at the point where the tape measure is stretched across the stream.

☐ Average Depths (feet) x ☐ Stream Width (feet) = ☐ Cross Sectional Area (feet)²

Step 2: Determine the average velocity for the stream. A minimum of four velocity measurements should be taken from equal intervals across the stream's width. For example, if the stream is eight feet wide, then velocity measurements should be taken at approximately every foot and a half across the stream in order to derive four measurements. For a stream width of 16 feet, velocity measurements should be taken at approximately three feet increments across the stream to derive four measurements. This method of measuring the stream velocity will ensure that velocity measurements are recorded for the slow and fast portions of the stream. For greater accuracy, more than four measurements are recommended for wider streams.

To measure the water's surface velocity, the first step is to select two points located equal distance upstream and downstream from the tape measure you have stretched across the stream. Determine the distance between these two points and record this value (in feet) in the **Distance Box** on the back of this page. A 10-foot total float distance is a recommended starting point. This distance can be lenghtened or shortened depending on stream swiftness. Count the number of seconds it takes a neutrally buoyant object (such as a wiffle practice golf ball) to float this distance. Record this time (in seconds) in the table on the back of this page for each float trial you complete.

Velocity Float Trials	
Trial Number	Time (seconds)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Sum	

Distance Box

Distance Floated (in feet)

The next step in calculating the surface velocity is to determine the average float time. Average float time is equal to the sum of the float times (in seconds) divided by the number of float trials.

Sum of Float Times (seconds) ÷ Number of Trials = Average Float Time (seconds)

The final step is to divide the distance floated (from the **Distance Box** at top) by the average float time.

Distance Floated (feet) ÷ Average Float Time (seconds) = Average Surface Velocity (feet per second)

Water in the stream does not all travel at the same speed. Water near the bottom travels slower than water at the surface because of friction (or drag) on the stream bottom. When calculating stream discharge, the water's velocity for the entire depth (surface to bottom) needs to be determined. Therefore, you must multiply the average **surface** velocity (from above) by a correction factor to make it represent the water velocity of the **entire stream depth.**

Choose the correction factor that best describes the bottom of your stream and multiply it by the average surface velocity to calculate the corrected average stream velocity.

Stream Bottom Type: Rough, loose rocks or coarse gravel: **correction value = 0.8**
Smooth, mud, sand, or bedrock: **correction value = 0.9**

Correction Value x Average Surface Velocity (feet per second) = Corrected Average Stream Velocity (feet per second)

<u>Step 3: Calculate the stream discharge.</u> Multiply the cross-sectional area (Feet)^2 from **Step 1** by the corrected average stream velocity (Feet/Second) from **Step 2.**

Cross-Sectional Area (feet)^2 x Corrected Average Stream Velocity (feet per second) = Stream Discharge (feet)^3 per second or cubic feet per second (cfs)

Fish Present (Please Mark) **Yes** ☐ or **No**☐

SUBMIT DATA ONLINE:
www.mostreamteam.org/reporting-forms.html

Data may be mailed to:
VWQM Coordinator, Water Protection Program, Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102