

## **Attachment B**

### **APPENDIX E**

#### **STREAM TYPES**

One method of classifying streams is through physical, hydrological, and biological characteristics. Using these features, streams can fall into one of three types: perennial, intermittent, and ephemeral. Definitions and characteristics of each stream type are provided in this Appendix.

As part of the review process of a land development project, the identification and documentation of perennial and intermittent streams on or near the proposed development site are required to define protective buffers around such streams. But distinguishing between these two stream types is not critical since their buffers, as specified by these Guidelines, are the same.

The delineation of ephemeral streams is particularly important in a watershed where there are regulatory requirements to define buffers around them. In these Guidelines, protective buffers around ephemeral streams are defined differently than buffers for intermittent and perennial streams. Therefore, in watersheds where the preservation of ephemeral streams is required, it is important to distinguish between ephemeral and other stream types on and near a development site.

To determine the characteristics of a stream and to help classify the stream type, data and observations should be collected in the field, as well as from already documented information. Previously approved NRI/FSDs or plan drawings for the subject site or for nearby sites may provide useful information on land features, including streams, that exist on or near the subject site. If available, historical flow and biological monitoring data may be checked to supplement field data. In addition, mapped information, such as topographic and soil maps, Geographic Information System (GIS), and fine resolution Light Detection and Ranging (LIDAR) can also be used as preliminary data sources. However, such maps are generally not based on detailed stream data and must be supplemented with data acquired in the field.

Although each of the stream types have typical characteristics, it can sometimes be difficult to place a stream into a specific type because not all of the characteristics may be present, and characteristics can overlap and vary based on time of year and weather conditions. Best professional judgment must be applied when classifying a stream.

#### **Documented Data**

Prior to conducting field work to collect data on or to verify the extent, location, and characteristics of streams on or near a subject site, a plan preparer or plan reviewer should review previously documented information for the site and surrounding area. Such documented information could include, but would not be limited to, the following:

- Aerial photography
- Topography
- Digital terrain based on LIDAR Data
- Soils data
- Mapped streams

- Land cover, including forest and tree stands, buildings, roads, etc.
- Property boundaries and other property information
- Recent weather and climate conditions
- Historical hydrologic and biological data
- Floodplain maps
- Mapped wetlands

Possible sources of this data include: GIS data maintained by the M-NCPPC, Montgomery County Information Technology and Innovation Department, Montgomery County DEP databases, USDA NRCS Soils Survey (available from USDA’s website), previously submitted and approved NRI/FSDs or plan drawings for the subject site or for nearby sites, USGS, and NWS.

**Stream Types and Their Characteristics**

Each of the three stream types are described below. Characteristics that are listed represent those that are typical of each stream type in Montgomery County and should be observable under normal conditions. If a site is subject to unusual or extreme natural or man-made conditions one or more of these stream characteristics may be absent, either temporarily or permanently. Therefore, prior to conducting field work on a site, a plan preparer or plan reviewer should consider factors that could affect stream type determination.

**Perennial Streams**

Perennial Stream – Streams that typically have continuous baseflow from the groundwater table, which is generally located above the streambed throughout the year.

<b>Stream Characteristics:</b>	
<b>Typically Present in Perennial Streams</b>	<b>Typically Absent in Perennial Streams</b>
Baseflow present in the channel throughout the year	Dry channel during parts of the year
Sinuuous channel	
Very well-defined channel banks and bed that include riffles and pools	
Evidence of fluctuating high-water marks, such as sediment-stained leaves, blackened or decaying leaf litter, bare ground, or vegetation drift lines	
Evidence of soil and debris movement (scouring) in the channel. Leaf litter is transient or temporary in the channel.	
Wetland or hydrophytic vegetation may be present	
Stream bank soils with hydric indicators at or above the low flow conditions	
Seeps, springs, or wetlands may be adjacent to or feed into stream channel	

<b>Stream Characteristics:</b>	
<b>Typically Present in Perennial Streams</b>	<b>Typically Absent in Perennial Streams</b>
Aquatic fauna present such as benthic macroinvertebrates, fish, stream salamanders, tadpoles, or crayfish	
Algae-covered or water-stained rocks	
Sorted sediments	

### **Intermittent Streams**

Intermittent Stream – Streams that typically have baseflow at least once per year. Typically, in the winter and spring, the groundwater table is elevated, increasing the likelihood that the groundwater level is higher than the bed of a stream channel. Therefore, an intermittent stream will usually have baseflow during the winter and spring seasons and infrequent baseflow during the rest of the year. Because of discontinuous flow regimes, intermittent streams typically have physical, hydrological, and biological characteristics that are not as well-developed as perennial streams. Depending on the frequency and duration of flows, however, the characteristics of intermittent streams can be similar to those of either perennial or ephemeral streams.

<b>Stream Characteristics:</b>	
<b>Typically Present in Intermittent Streams</b>	<b>Typically Absent in Intermittent Streams</b>
Baseflow present in the channel at least once per year	Baseflow present in the channel throughout the year
Sinuuous channel	
Very well-defined channel banks and bed that include riffles and pools	
Evidence of fluctuating high-water marks, such as sediment-stained leaves, blackened or decaying leaf litter, bare ground, or vegetation drift lines	
Evidence of soil and debris movement (scouring) in the channel. Leaf litter is transient or temporary in the channel.	
Wetland or hydrophytic vegetation may be present	
Stream bank soils with hydric indicators at or above the low flow conditions	
Seeps, springs, or wetlands may be adjacent to or feed into the stream channel	
Aquatic fauna present when there is surface flow; during dry periods, signs of the presence of stream biota at other times of the year	
Algae-covered or water-stained rocks	
Channel head-cuts at the beginning of intermittent streams may be, but are not always, present	
Sorted sediments	

## Ephemeral Streams

Ephemeral Stream -- Streams that are above the groundwater table and convey flow only during, and for a short duration after (generally less than 48 hours), and in direct response to, a precipitation event. Ephemeral streams do not include roadside ditches.

Ephemeral streams typically have a highly discontinuous storm-driven flow regime with insufficient flow durations to establish the observable biological, physical, and hydrological characteristics typically associated with the intermittent or continuous conveyance of water.

Under these Guidelines, protected ephemeral streams are those in the Ten Mile Creek watershed within the Ten Mile Creek Master Plan area that touch or overlap with environmental buffers associated with other downstream hydrologic features (e.g., perennial, and intermittent streams, floodplains, wetlands, seeps, and springs). Ephemeral stream segments in the Ten Mile Creek watershed within the Ten Mile Creek Master Plan area that are upslope from protected ephemeral stream segments are also protected under these Guidelines if the upslope ephemeral stream touches or overlaps the buffers of the downslope protected ephemeral streams.

<b>Stream Characteristics:</b>	
<b>Typically Present in Ephemeral Streams</b>	<b>Typically Absent in Ephemeral Streams</b>
poorly-developed sinuosity	moderate to well-developed sinuosity
evidence of leaf litter or small debris jams in flow areas	blackened or decayed leaf litter
poorly-sorted sediments	well-sorted sediments
poorly-developed removal of vegetation litter	streambed forms (such as riffles/pools, runs, point bars)
poorly-developed vegetation drift lines	frequent-flow marks, algae covered or water-stained or lined rocks
fibrous roots in channel	obligate wetland vegetation along or in channel
side slope soils with characteristics typical of the surrounding landscape	hydric soils in or adjacent to channel
	streamflow (except during or briefly [ $\leq$ 48 hrs.] after storms)
	alluvial deposits
	natural levees
	floodplains
	evidence of stream biota (e.g., fish, stream salamanders, or aquatic macroinvertebrates)