

APPENDIX 6

A-6. EASTERN GAULEY WATERSHEDS

A-6.1 Watershed Information

The six eastern Gauley watersheds are Big Run, Cherry River, Cranberry River, Little Laurel Creek, Turkey Creek, and Williams River. These TMDL watersheds are in the eastern portion of the Gauley River watershed and cumulatively drain approximately 409 square miles (261,845 acres), as shown in Figure A-6-1. The eastern Gauley watersheds are mostly forested.

Anthropogenic land disturbance activities are negligible in many areas, as significant portions of these watersheds fall within the Monongahela National Forest. The TMDL watershed areas and various landuses are shown in Table A-6-1.

Table A-6-1. Watershed area and landuse

| Watershed | Area | | | Percent Landuse | | | | |
|---------------------|-----------|-----------|--------------|-----------------|--------|-----|-------------|-------|
| | Acres | Sq. Miles | WAP Stations | Wetland | Forest | AML | Grass -land | Urban |
| Big Run | 2,279.1 | 3.6 | 1 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 |
| Cherry River | 105,890.1 | 165.5 | 36 | 0.1 | 94.5 | 1.8 | 2.7 | 0.7 |
| Cranberry River | 61,973.9 | 96.8 | 59 | 1.0 | 97.2 | 0.1 | 0.9 | 0.0 |
| Little Laurel Creek | 3,003.4 | 4.7 | 5 | 0.4 | 83.6 | 1.8 | 10.1 | 3.4 |
| Turkey Creek | 6,313.4 | 9.9 | 5 | 0.0 | 99.3 | 0.0 | 0.7 | 0.0 |
| Williams River | 82,385.7 | 128.7 | 30 | 0.2 | 96.8 | 0.0 | 2.8 | 0.0 |

There are 25 pH-impaired streams in the eastern Gauley watersheds that are addressed in this TMDL development effort. All of the impairments have been attributed to acid precipitation and low watershed buffering capacity. Figures A-6-2 and A-6-3 show the impaired segments.

Before establishing Total Maximum Daily Loads (TMDLs), WVDEP performed monitoring in each of the impaired streams in the Gauley River watershed to better characterize water quality and refine impairment listings. Monthly samples were taken at 136 stations (station locations can be viewed using the ArcExplorer project) throughout the eastern Gauley watersheds from July 1, 2003, through June 30, 2004. Monitoring suites at each site were determined based on the types of impairments observed in each stream. Streams impacted by acid precipitation were monitored for pH, specific conductance, acidity, alkalinity, sulfate and total calcium. In areas where historical mining activity was known to occur, total and dissolved iron and aluminum were also monitored. Instantaneous flow measurements were also taken at strategic locations during pre-TMDL monitoring.

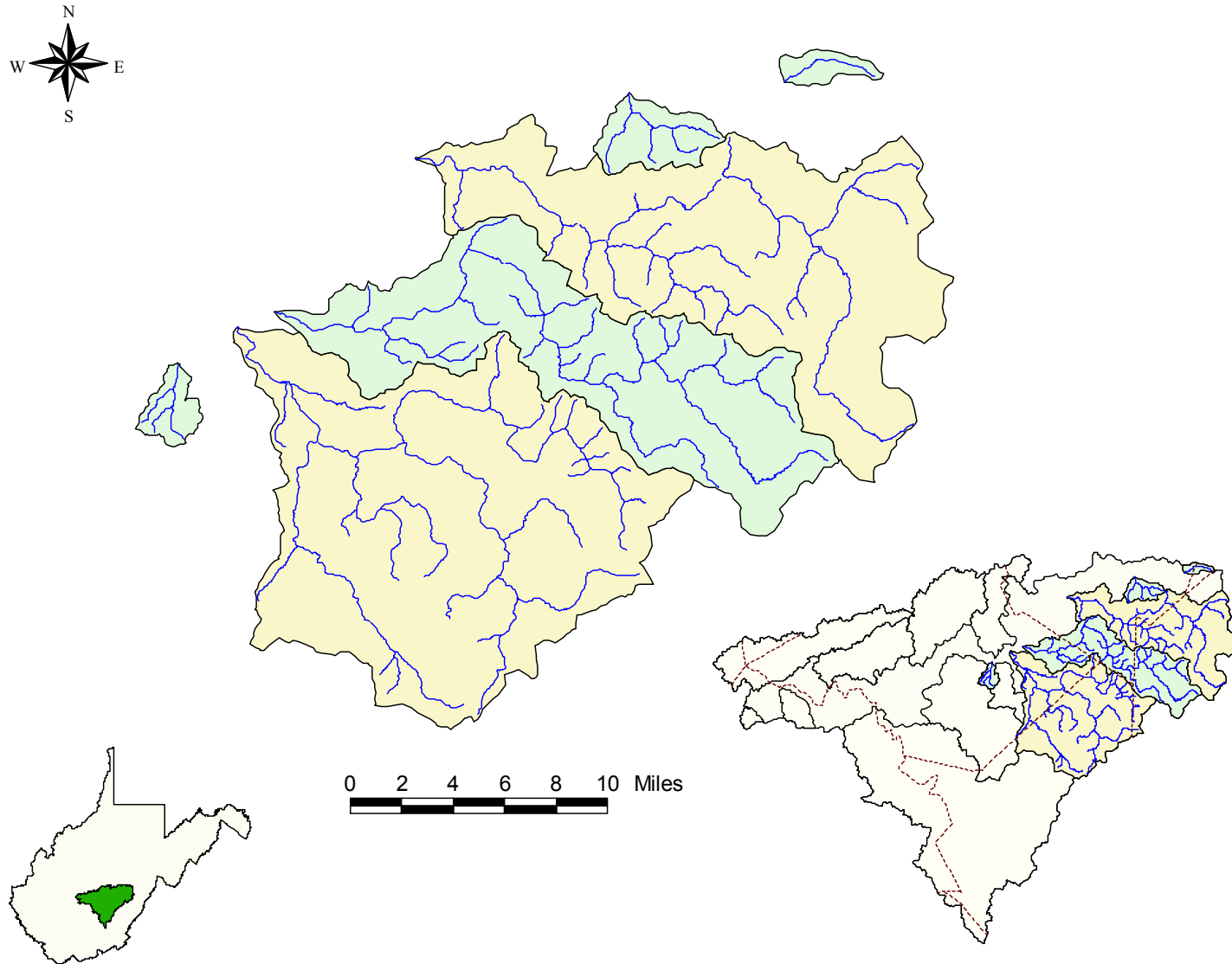
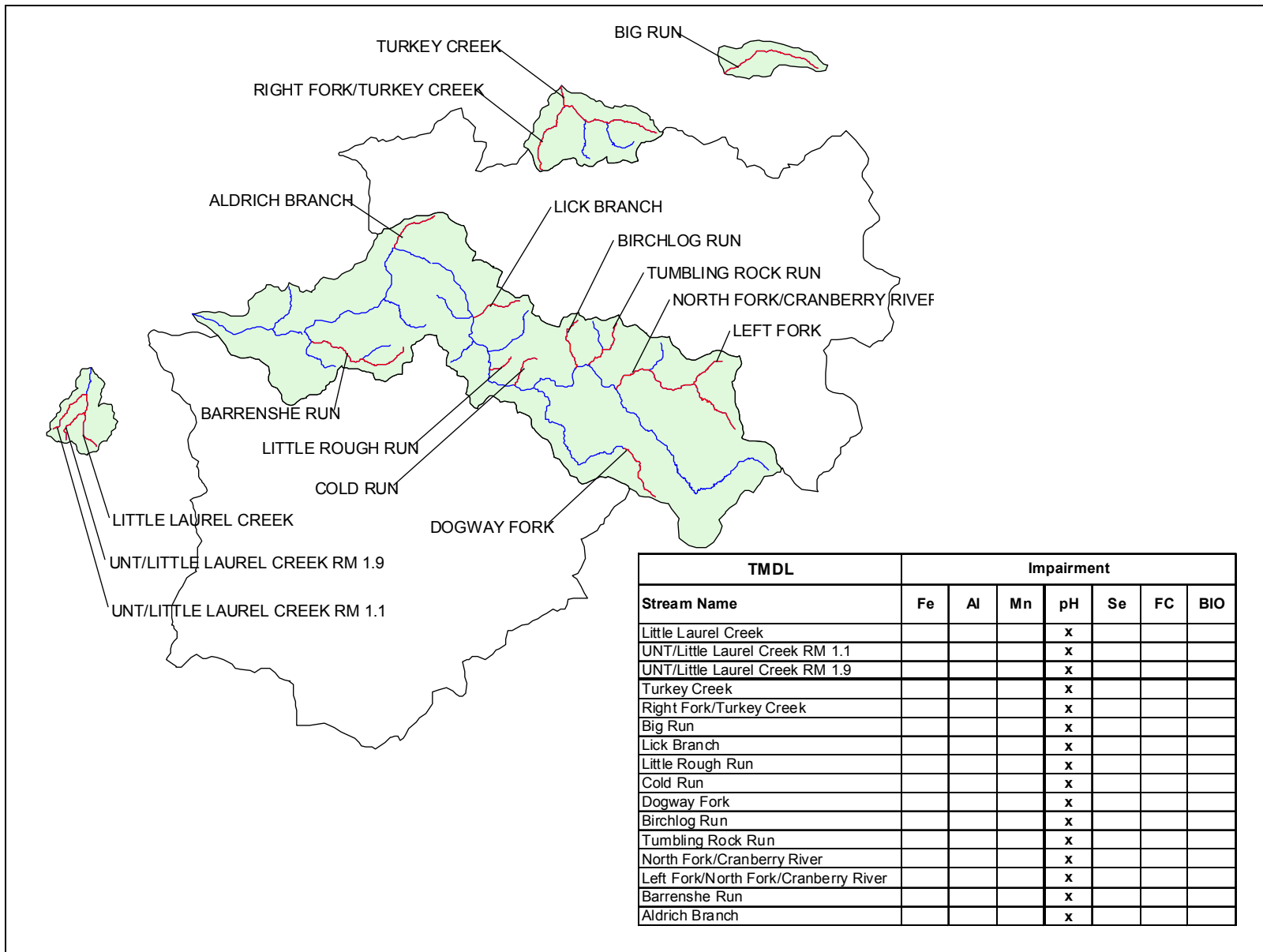
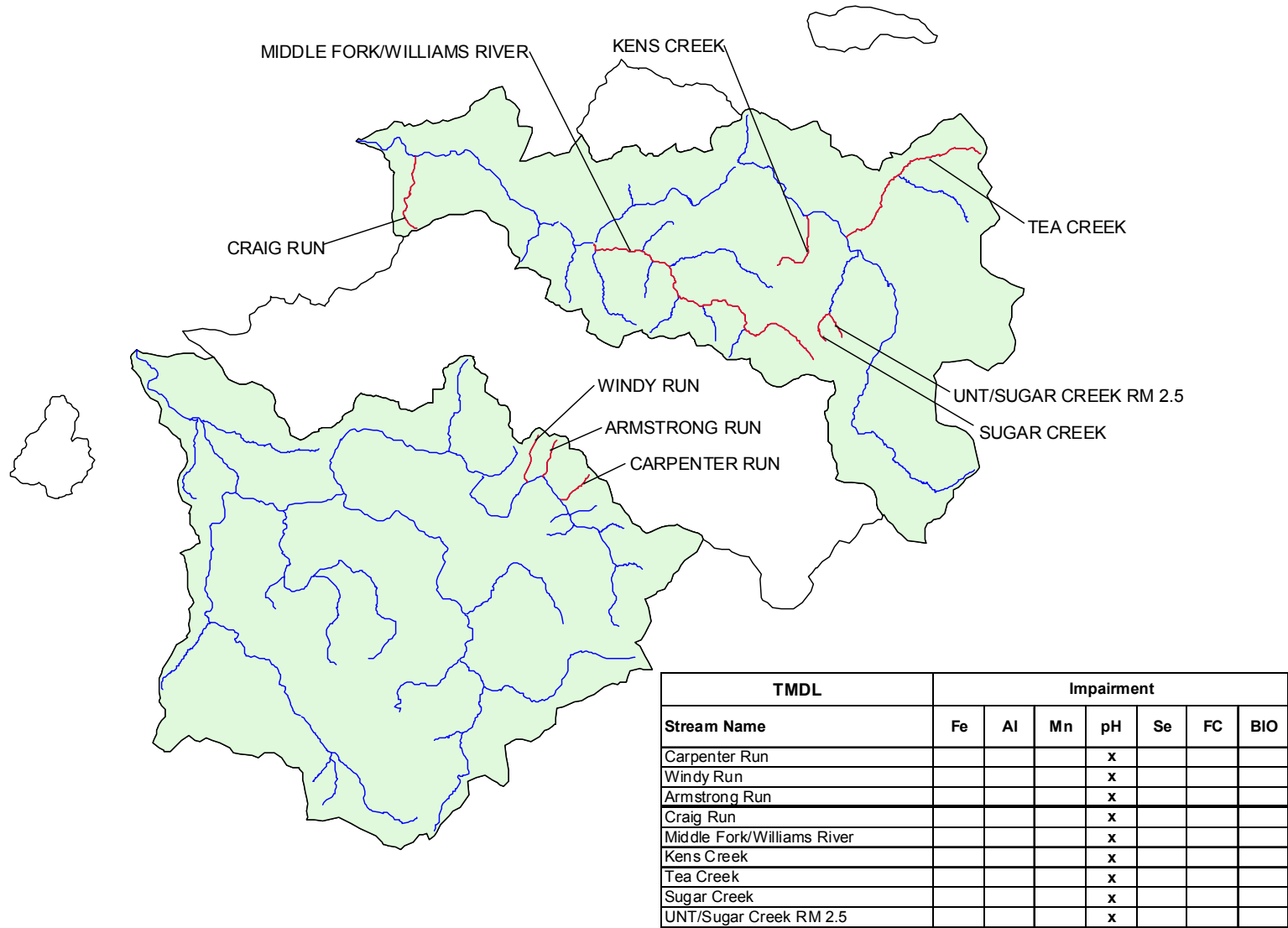


Figure A-6-1. Location of the eastern Gauley watersheds



A-6-2. Waterbodies and impairments under TMDL development in the eastern Gauley watersheds



A-6-3. Waterbodies and impairments under TMDL development in the eastern Gauley watersheds

A-6.2 Sources

The source of all of the low pH impairments in this watershed is acid precipitation. Acid precipitation impacts are accentuated by low watershed buffering capacity. Anthropogenic land disturbance activities are negligible in most areas, as much of the watershed falls within the Monongahela National Forest. Mining activity is present only in the Little Laurel Creek watershed. Pre-TMDL monitoring in that watershed demonstrated extremely low specific conductance and no iron, aluminum or biological impairments. In addition to water quality monitoring, WVDEP performed source tracking throughout the watersheds of the impaired streams and did not identify land-based low pH sources.

A-6.3 TMDL Development

For pH impairments associated with atmospheric deposition, TMDLs are presented as the annual net acidity load associated with maintenance of the pH TMDL endpoint. Because the source of impairment is limited to atmospheric deposition, these TMDLs incorporate only a gross load allocation. The TMDLs represent the annual net acidity loads that can be present at the downstream extent of impaired streams while maintaining the pH TMDL endpoint.

A-6.4 TMDL Tables: Metals and pH

Table A-6-2. pH TMDLs for the eastern Gauley watersheds

| Major Watersheds | Stream Name | Stream Code | Baseline Average Annual Net Acidity Load (ton/yr) | Allocated Average Annual Net Acidity Load (ton/yr) |
|---------------------|--|----------------|---|--|
| Little Laurel Creek | UNT/Little Laurel Creek RM 1.1 | WVKG-31-B | 0.56 | 0.42 |
| Little Laurel Creek | UNT/Little Laurel Creek RM 1.9 | WVKG-31-C | 0.32 | 0.24 |
| Little Laurel Creek | Little Laurel Creek upstream of RM 1.1 | WVKG-31 | 1.60 | 0.88 |
| Cherry River | Windy Run | WVKG-34-H-8 | 17.93 | 4.89 |
| Cherry River | Armstrong Run | WVKG-34-H-9 | 16.88 | 4.61 |
| Cherry River | Carpenter Run | WVKG-34-H-11.5 | 24.90 | 6.78 |
| Cranberry River | Barrenshe Run above Little Barrenshe | WVKGC-4 | 62.63 | 19.94 |
| Cranberry River | Aldrich Branch | WVKGC-9 | 0.79 | 0.55 |
| Cranberry River | Lick Branch | WVKGC-14 | 34.96 | 9.52 |
| Cranberry River | Little Rough Run | WVKGC-17.3 | 10.32 | 2.82 |
| Cranberry River | Cold Run | WVKGC-18 | 18.82 | 5.15 |
| Cranberry River | Dogway Fork upstream of RM 6.8 | WVKGC-19 | 47.26 | 12.85 |
| Cranberry River | Birchlong Run | WVKGC-21 | 40.26 | 11.00 |
| Cranberry River | Tumbling Rock Run | WVKGC-22 | 64.51 | 17.69 |
| Cranberry River | North Fork/Cranberry River | WVKGC-24 | 228.71 | 62.54 |
| Cranberry River | Left Fork | WVKGC-24-C | 39.22 | 10.70 |
| Williams River | Craig Run | WVKGW-1 | 2.44 | 1.70 |
| Williams River | Middle Fork/Williams River | WVKGW-10 | 600.94 | 164.52 |
| Williams River | Kens Creek | WVKGW-18 | 68.24 | 18.64 |
| Williams River | Tea Creek | WVKGW-20 | 8.09 | 5.84 |
| Williams River | Sugar Creek above RM 2.5 | WVKGW-21 | 199.10 | 65.70 |

Table A-6-2. pH TMDLs for the eastern Gauley watersheds (continued)

| Major Watersheds | Stream Name | Stream Code | Baseline Average Annual Net Acidity Load (ton/yr) | Allocated Average Annual Net Acidity Load (ton/yr) |
|---------------------|-------------------------|-------------|---|--|
| Williams River | UNT/Sugar Creek RM 2.5 | WVKGW-21-B | 148.55 | 49.01 |
| Turkey Creek | Turkey Creek | WVKG-60 | 16.16 | 5.16 |
| Turkey Creek | Right Fork/Turkey Creek | WVKG-60-A | 5.25 | 1.70 |
| Gauley Direct Drain | Big Run | WVKG-70 | 61.72 | 19.64 |

UNT = unnamed tributary.