

## APPENDIX 3

### A-3. CABIN CREEK

#### A-3.1 Watershed Description

Cabin Creek is in the central portion of the Upper Kanawha watershed, as shown in Figure A-3-1, and drains approximately 72 square miles (46,398 acres). Figure A-3-2 shows the land use distribution in the watershed. The dominant land use in the watershed is forest, which covers 94.63 percent of the watershed. Other important land use types include urban/residential (2.12 percent) and barren/mining land (2.80 percent). All other individual land cover types account for less than 2 percent of the total watershed area.

There are 20 impaired streams in the watershed, including Cabin Creek itself. Figure A-3-3 shows the impaired segments and the pollutants for which each is impaired.

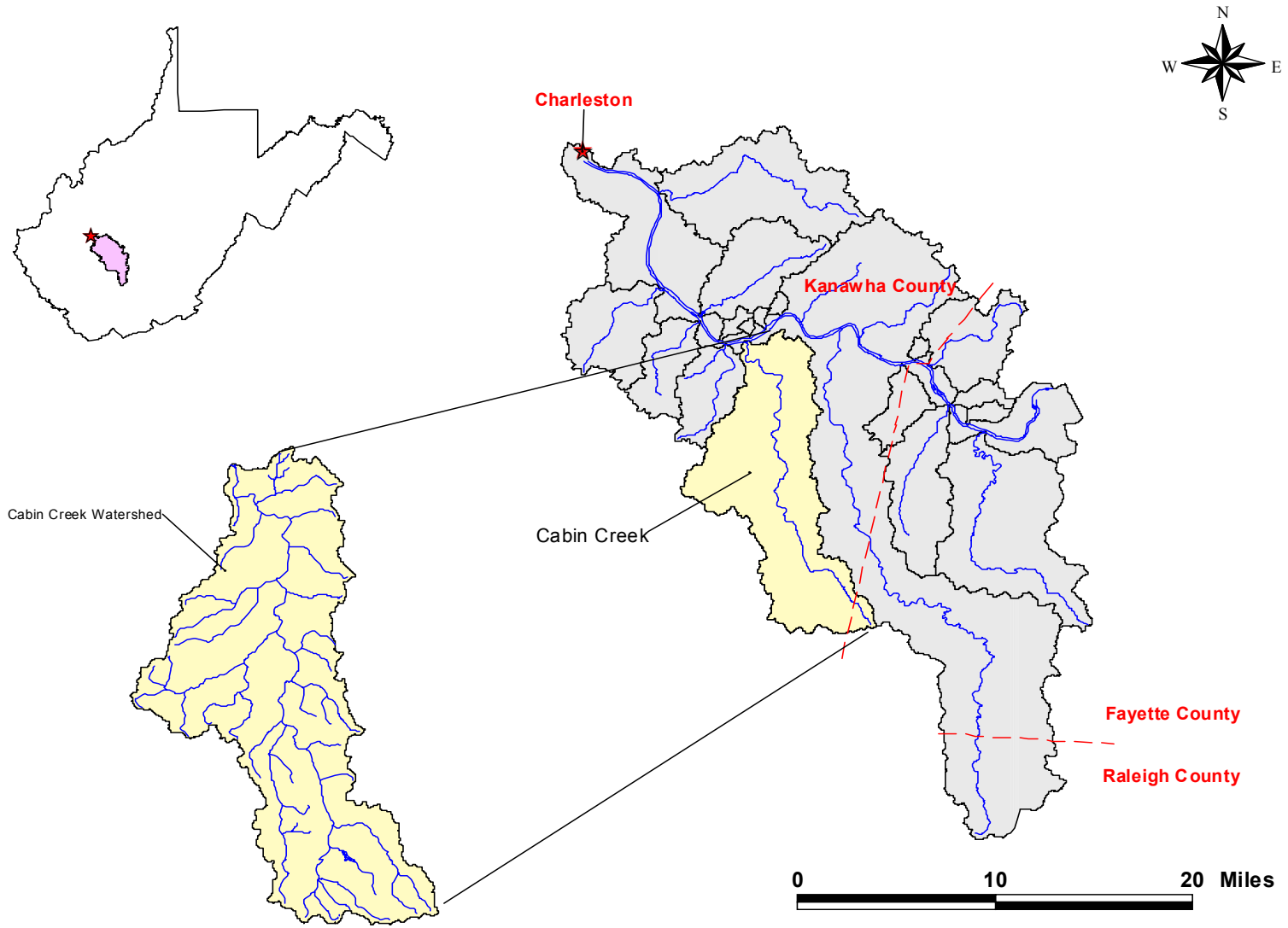


Figure A-3-1. Location of the Cabin Creek watershed

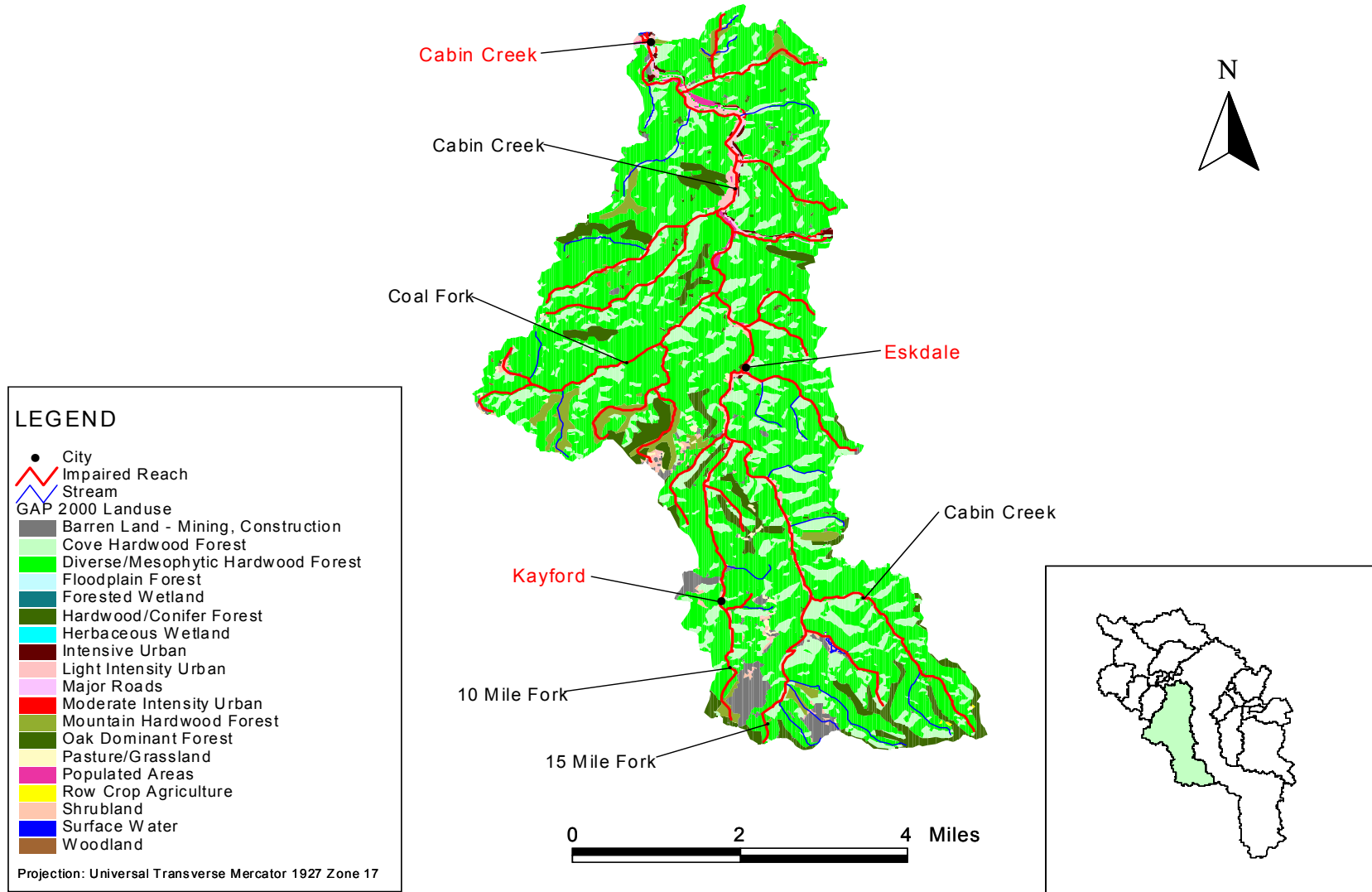
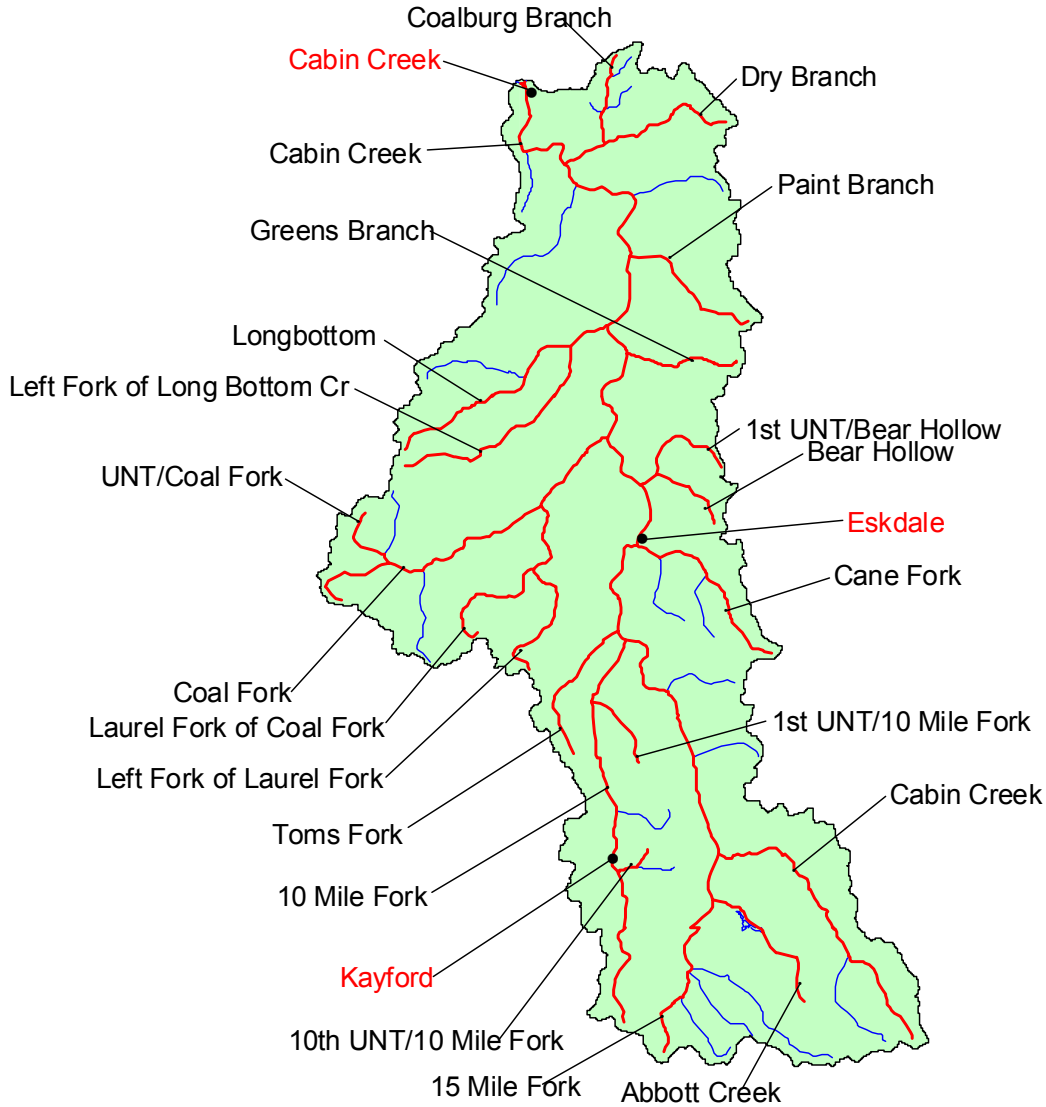


Figure A-3-2. Land use distribution in the Cabin Creek watershed



| Stream                         | Aluminum | Iron | Manganese | pH | Biological | Fecal Coliforms |
|--------------------------------|----------|------|-----------|----|------------|-----------------|
| Cabin Creek                    | X        | X    | X         | X  | X          | X               |
| Dry Branch                     |          | X    |           |    |            | X               |
| Coalburg Branch                | X        |      |           | X  | X          |                 |
| Paint Branch                   |          | X    |           |    |            |                 |
| Longbottom                     |          |      |           |    |            | X               |
| Left Fork of Long Bottom Creek |          |      |           |    | X          |                 |
| Greens Branch                  |          |      |           | X  |            | X               |
| Coal Fork                      | X        |      |           |    |            |                 |
| Laurel Fork of Coal Fork       | X        | X    | X         |    | X          |                 |
| Left Fork of Laurel Fork       |          |      |           |    | X          |                 |
| UNT/Coal Fork                  | X        | X    | X         |    |            |                 |
| Bear Hollow                    | X        |      |           | X  | X          | X               |
| 1st UNT/Bear Hollow            | X        |      | X         | X  | X          | X               |
| Cane Fork                      | X        | X    | X         | X  | X          |                 |
| Toms Fork                      | X        |      |           |    |            |                 |
| 10 Mile Fork                   | X        | X    |           |    | X          |                 |
| 1st UNT/10 Mile Fork           | X        |      |           |    |            |                 |
| 10th UNT/10 Mile Fork          |          | X    |           |    |            |                 |
| 15 Mile Fork                   | X        | X    | X         | X  |            |                 |
| Abbott Creek                   | X        | X    | X         | X  |            |                 |

Figure A-3-3. Impaired waterbodies in the Cabin Creek watershed

### A-3.2 Pre-TMDL Monitoring

Before establishing Total Maximum Daily Loads (TMDLs), WVDEP performed monitoring in each of the impaired streams in the Upper Kanawha watershed to better characterize water quality and to refine impairment listings. Monthly samples were taken at 339 stations throughout the Upper Kanawha watershed from July 1, 2001, through June 30, 2002. The locations of the pre-TMDL monitoring stations in the Cabin Creek watershed are shown in Figure A-3-4. Monitoring suites at each site were determined based on the types of impairments observed in each stream. Streams impaired by metals and low pH were sampled monthly and analyzed for a suite of parameters (including total iron, dissolved iron, total aluminum, dissolved aluminum, total manganese, total suspended solids, pH, sulfate, and specific conductance). Monthly samples from streams impaired by fecal coliform bacteria were analyzed for fecal coliform bacteria, pH, and specific conductance. Appropriate monitoring suites were selected for streams with multiple impairments. For example, if a stream was impaired for metals and fecal coliform bacteria, the samples were analyzed for total iron, dissolved iron, total aluminum, dissolved aluminum, total manganese, total suspended solids, pH, sulfate, specific conductance, and fecal coliform bacteria. In addition, benthic macroinvertebrate assessments were performed at specific locations on the biologically impaired streams during the pre-TMDL monitoring period. When conditions allowed, instantaneous flow measurements were also taken at the pre-TMDL sampling locations.

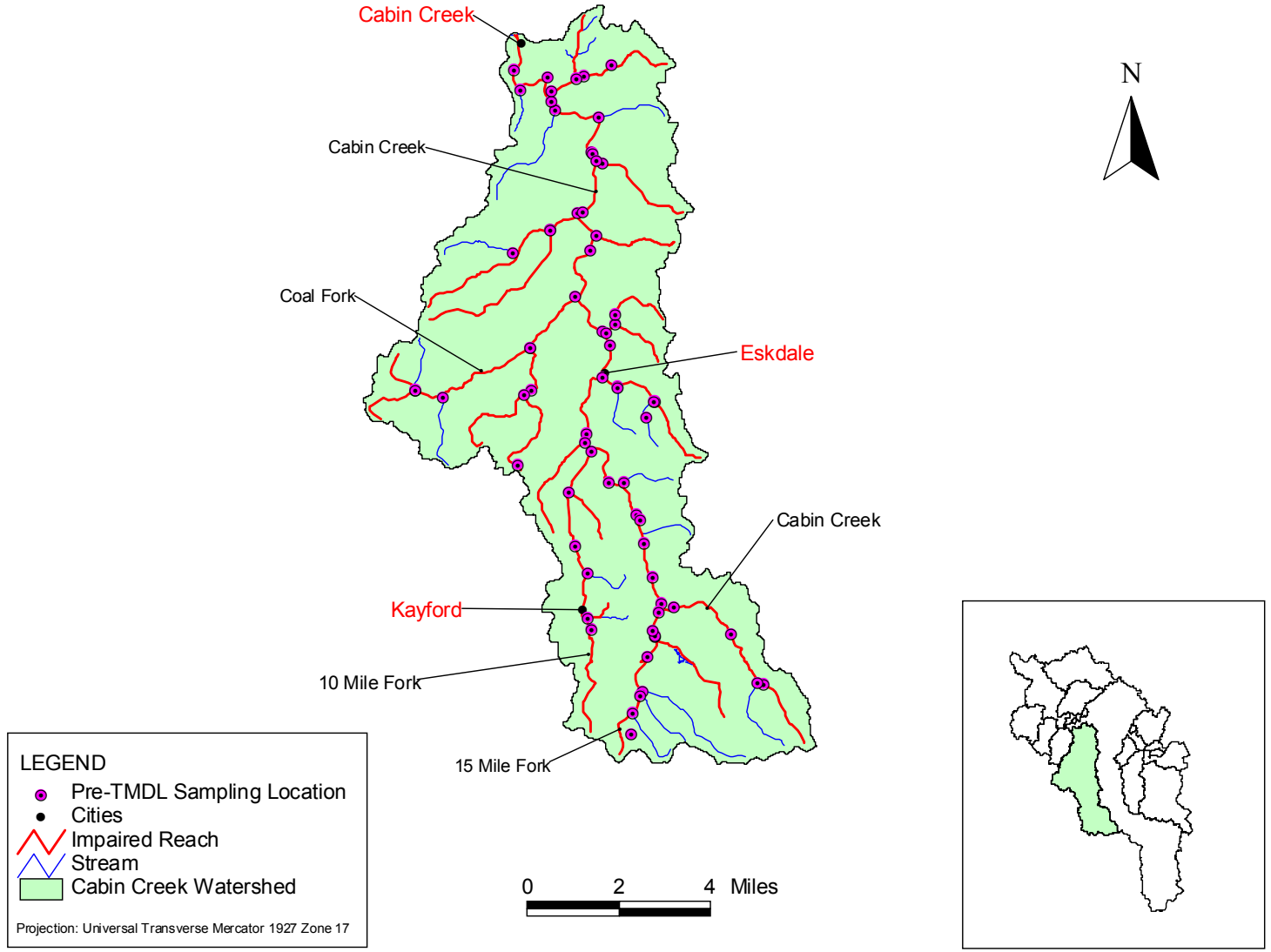


Figure A-3-4. Pre-TMDL monitoring stations in the Cabin Creek watershed

### A-3.3 Metals and pH Sources

This section identifies and examines the potential sources of aluminum, iron, manganese, and pH impairment in the Cabin Creek watershed. Sources can be classified as either point sources (specific sources subject to a permit) or nonpoint sources (diffuse sources). Mining- and non-mining related permits are used to classify metals and pH point sources. Metals and pH nonpoint sources are diffuse, non-permitted sources such as abandoned or forfeited mine sites.

Pollution sources were identified using statewide geographic information system (GIS) coverages of point and nonpoint sources, and through field reconnaissance. As part of the TMDL process, WVDEP documented pollution sources by describing the pollution source in detail, collecting Global Positioning System data and if necessary collecting a water quality sample for laboratory analysis. WVDEP personnel recorded physical descriptions of the pollutant sources, such as the number of outfalls, the source of the outfalls, and the general condition of the stream in the vicinity of each outfall. These records were compiled and electronically plotted on maps using GIS software. This information was used in conjunction with other information to characterize pollutant sources.

Based on scientific knowledge of sediment/metal interaction and knowledge of West Virginia's soils, it is reasonable to conclude that sediments contain high levels of aluminum and iron, and, to a lesser extent, manganese. Control of sediment-producing sources may be necessary to meet water quality criteria for dissolved aluminum, total iron, and total manganese during critical high flow conditions.

#### A-3.3.1 Metals Point Source Inventory

As described in the main report, the National Pollutant Discharge Elimination System (NPDES) program, established under Clean Water Act sections 318, 402, and 405, requires permits for the discharge of pollutants from point sources. Metals and pH point sources can be classified into two major categories: permitted non-mining point sources and permitted mining point sources.

##### *Permitted Non-mining Metals Point Sources*

Metals-related non-mining NPDES permits are not present in the Cabin Creek watershed.

##### *Permitted Mining Metals Point Sources*

WVDEP's HPU GIS coverage was used to determine the locations of the mining permits; the detailed permit information came from WVDEP's ERIS database system. Three hundred twenty-nine mining-related NPDES outlets were found in the watershed (Figure A-3-5). The permits related to these outlets are listed in the Technical Report, which shows the name of each responsible party and the total number of outlets that discharge to the Cabin Creek watershed. The Technical Report also contains detailed information on NPDES/Article 3 permit relationships, specific data for each permitted outlet, and permit limits for each of the mining-related NPDES outlets.

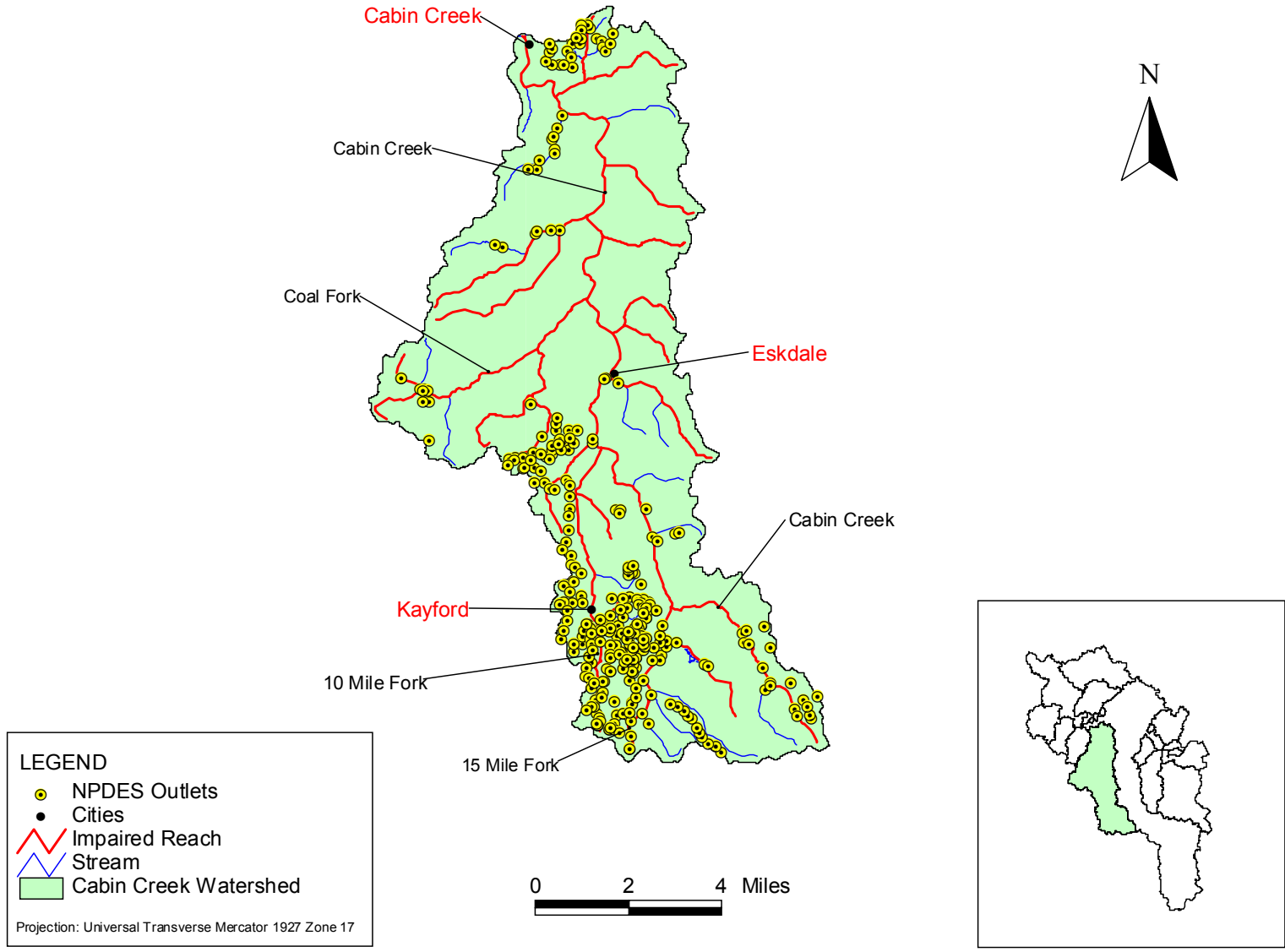


Figure A-3-5. NPDES outlets in the Cabin Creek watershed



### **A-3.3.2 Metals Nonpoint Source Inventory**

In addition to point sources, nonpoint sources also contribute to metals-related water quality impairments in the Cabin Creek watershed. Nonpoint sources are diffuse, non-permitted sources. Abandoned mines can create acid mine drainage, which contributes low pH and high metals concentrations to surface and subsurface waters; therefore, abandoned mine lands can be a significant non-permitted source of metals and pH impairment. Facilities that were subject to the Surface Mining Control and Reclamation Act of 1977 and forfeited their bonds or abandoned operations can be a significant mining-related non-permitted source. Non-mining land disturbance activities can also be a nonpoint source of metals, causing metals to enter waterbodies as a component of sediment. Examples of such land disturbance activities are agriculture, forestry, oil and gas wells, and the construction and use of roads.

#### ***Abandoned Mine Lands and Bond Forfeiture Sites***

Based on the identification of a number of abandoned mining activities in the Cabin Creek watershed, abandoned mine lands are a significant non-permitted source of metals and pH impairment in the watershed. WVDEP's Office of Abandoned Mine Lands identified the locations of abandoned mine lands in the Cabin Creek watershed. In addition, source-tracking efforts by WVDEP's Division of Water and Waste Management identified and characterized 57 abandoned mine sources (discharges, seeps, portals, culverts, refuse piles, diversion ditches, and ponds).

WVDEP's Division of Land Restoration, Office of Special Reclamation, made bond forfeiture data available. This information included the status of both land reclamation and water treatment activities. Three bond forfeiture sites are present in the Cabin Creek watershed.

The locations of abandoned mine lands and bond forfeiture sites are shown in Figure A-3-6.

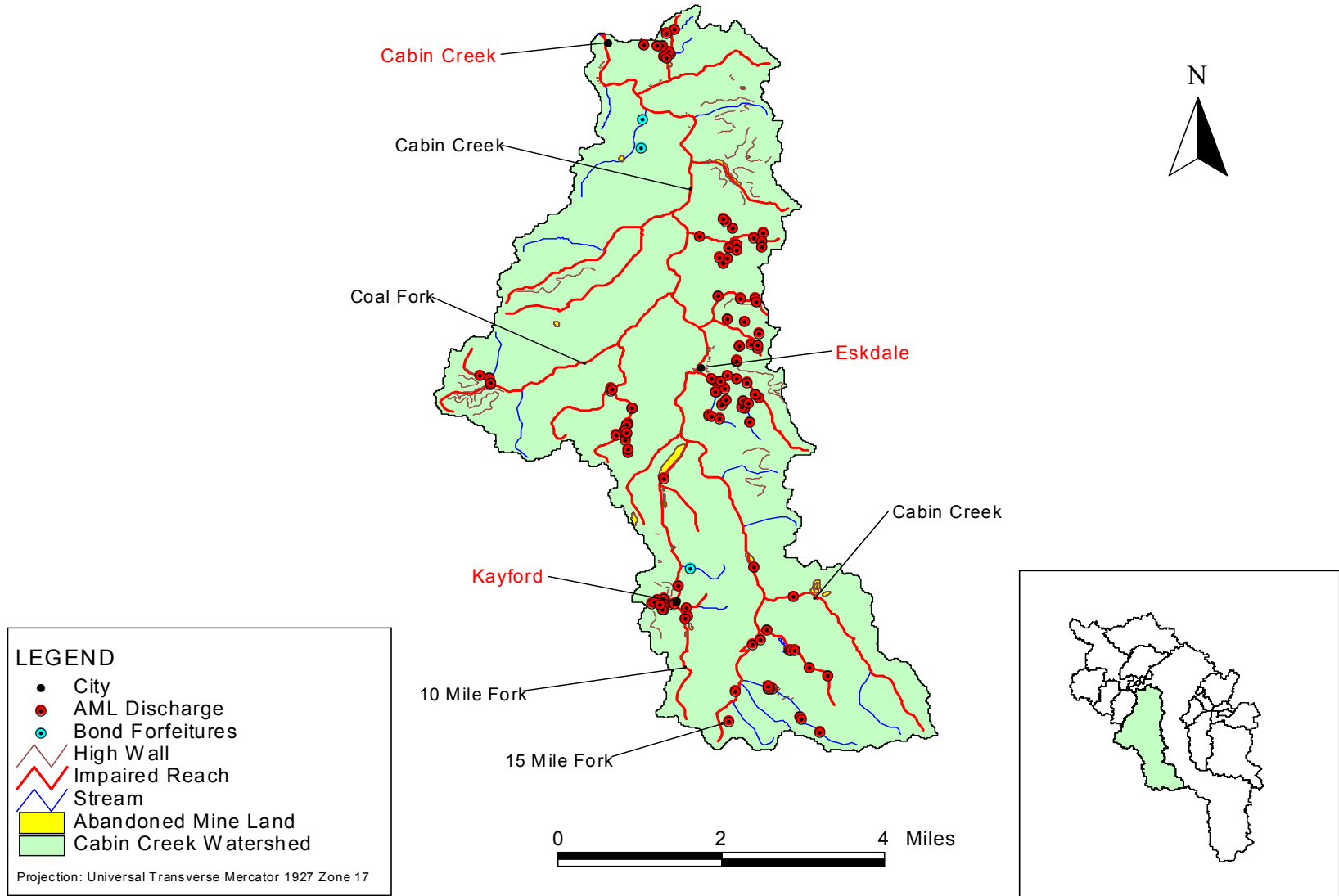


Figure A-3-6. Abandoned mine lands and bond forfeiture sites in the Cabin Creek watershed

### *Land Disturbance Activities*

Land disturbance resulting from agriculture, forestry, oil and gas operations, and the construction and use of roads can contribute metals to streams. The areas related to these activities and the number of sites in the Cabin Creek watershed are discussed below.

#### **Agriculture**

Based on the GAP 2000 land use coverage, agricultural areas cover 184.2 acres (0.40 percent) of the Cabin Creek watershed.

#### **Forestry**

The active logging operations in the Cabin Creek watershed are listed in Table A-3-1. The disturbed areas associated with these operations are estimated to cover 3,120 acres (6.7 percent) of the total watershed area.

**Table A-3-1.** Logging sites in the Cabin Creek watershed

| <b>Logging Site ID</b> | <b>Area of Logging Sites (acres)</b> | <b>Percentage of Watershed</b> | <b>Logged Area that Consists of Roads/Landings (acres)</b> | <b>Percentage of Total Logging Area that Consists of Roads/Landings</b> |
|------------------------|--------------------------------------|--------------------------------|--|---|
| K-61: L-1              | 4                                    | 0.0%                           | 0.5  | 12.5%   |
| K-61: L-2              | 70                                   | 0.2%                           | 4.2  | 6.0%  |
| K-61: L-3              | 105                                  | 0.2%                           | 7.1  | 6.8%  |
| K-61: L-4              | 175                                  | 0.4%                           | 10.2   | 5.8%  |
| K-61: L-5              | 200                                  | 0.4%                           | 13.2   | 6.6%  |
| K-61: L-6              | 225                                  | 0.5%                           | 12.9   | 5.7%  |
| K-61: L-7              | 300                                  | 0.6%                           | 23.7   | 7.9%  |
| K-61: L-8              | 300                                  | 0.6%                           | 19.4   | 6.5%  |
| K-61: L-9              | 600                                  | 1.3%                           | 39.0   | 6.5%  |
| K-61: L-10             | 1,141                                | 2.4%                           | 65.9   | 5.8%  |
| <b>Total</b>           | <b>3,120</b>                         | <b>6.7%</b>                    | <b>196.2</b>   | <b>6.3%</b>   |

#### **Oil and Gas Wells**

There are 250 active oil and gas wells in the Cabin Creek watershed, the locations of which are indicated in Figure A-3-7. Based on the survey by WVDEP's Office of Oil and Gas, it is estimated that 40.12 acres (0.09 percent) of the Cabin Creek watershed are disturbed by the active well sites (including areas associated with access roads).

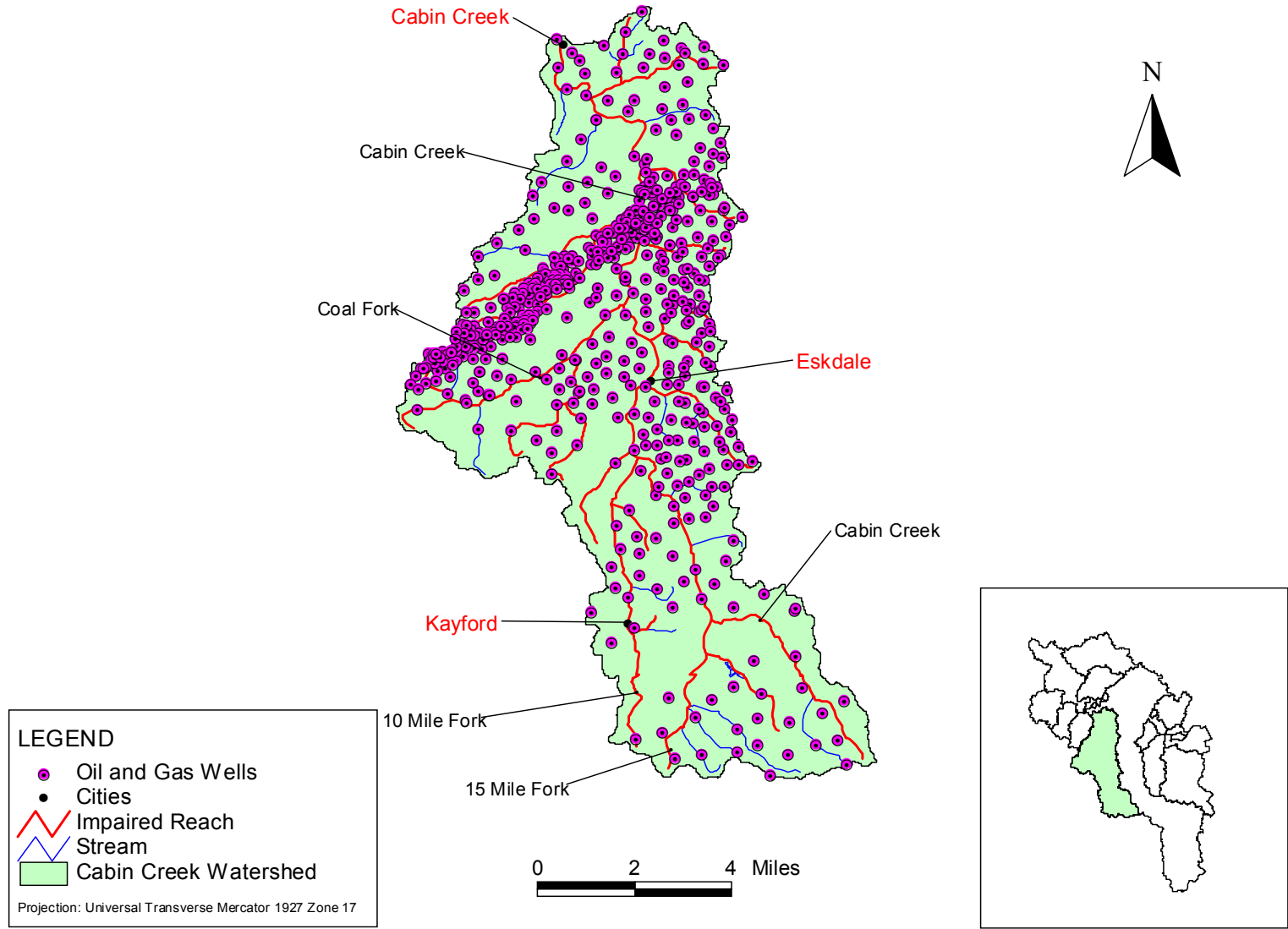


Figure A-3-7. Oil and gas wells in the Cabin Creek watershed

## Roads

The length and area of paved roads were calculated using the Census 2000 TIGER/Line files roads coverage for West Virginia. Information on unpaved roads from TIGER was supplemented by digitizing any unpaved roads on topographic maps that were not included in the TIGER shapefile. Table A-3-2 summarizes the length, area, and percentage of total watershed area of both paved and unpaved roads in the Cabin Creek watershed.

**Table A-3-2.** Road miles by type in the Cabin Creek watershed

| Road Type     | Road Distance (miles) | Road Area (acres) | Road Area as Percentage of Watershed |
|---------------|-----------------------|-------------------|--------------------------------------|
| Total paved   | 58.96                 | 131.56            | 0.28%                                |
| Total unpaved | 499.77                | 742.15            | 1.61%                                |

### A-3.4 Fecal Coliform Bacteria Sources

This section identifies and examines the potential sources of fecal coliform bacteria in the Cabin Creek watershed. Sources can be classified as either point sources (specific sources subject to a permit) or nonpoint sources (diffuse sources). Point sources of fecal coliform bacteria are classified by several different types of sewage permits and the point source discharges regulated therein. Nonpoint sources are diffuse, non-permitted sources.

#### A-3.4.1 Fecal Coliform Bacteria Point Sources

Permitted sources of fecal coliform bacteria that experience effluent overflows or that do not comply with permit limits can cause occasional high loadings of fecal coliform bacteria in receiving streams. In the Cabin Creek watershed there is one discharge permit, which is for a Home Aeration Unit for sewage treatment.

#### A-3.4.2 Nonpoint (Non-permitted) Fecal Coliform Bacteria Sources

Pollutant source tracking by WVDEP personnel identified scattered areas of high population density without access to public sewers in the Cabin Creek watershed. Human sources of fecal coliform bacteria from these areas include sewage discharges from failing septic systems, and possible direct discharges of sewage from residences (straight pipes). The West Virginia Bureau for Public Health estimates septic tank failure rates in this area to be 70 percent in the first 10 years (WV Bureau for Public Health 2003). An analysis of census data from the 1990 Census combined with WVDEP source-tracking information yielded an estimate of 1,746 people living in the unsewered homes in the Cabin Creek watershed. Figure A-3-8 shows the estimated distribution of the unsewered population in the watershed. It is important to note that data collection and source characterization for this TMDL occurred in 2001–2002, prior to the completion of several ongoing sewer projects in the Cabin Creek watershed. It is expected that the completion of these sewer projects will result in improved water quality. Sewer projects are further explained in section 10 of the Upper Kanawha report.

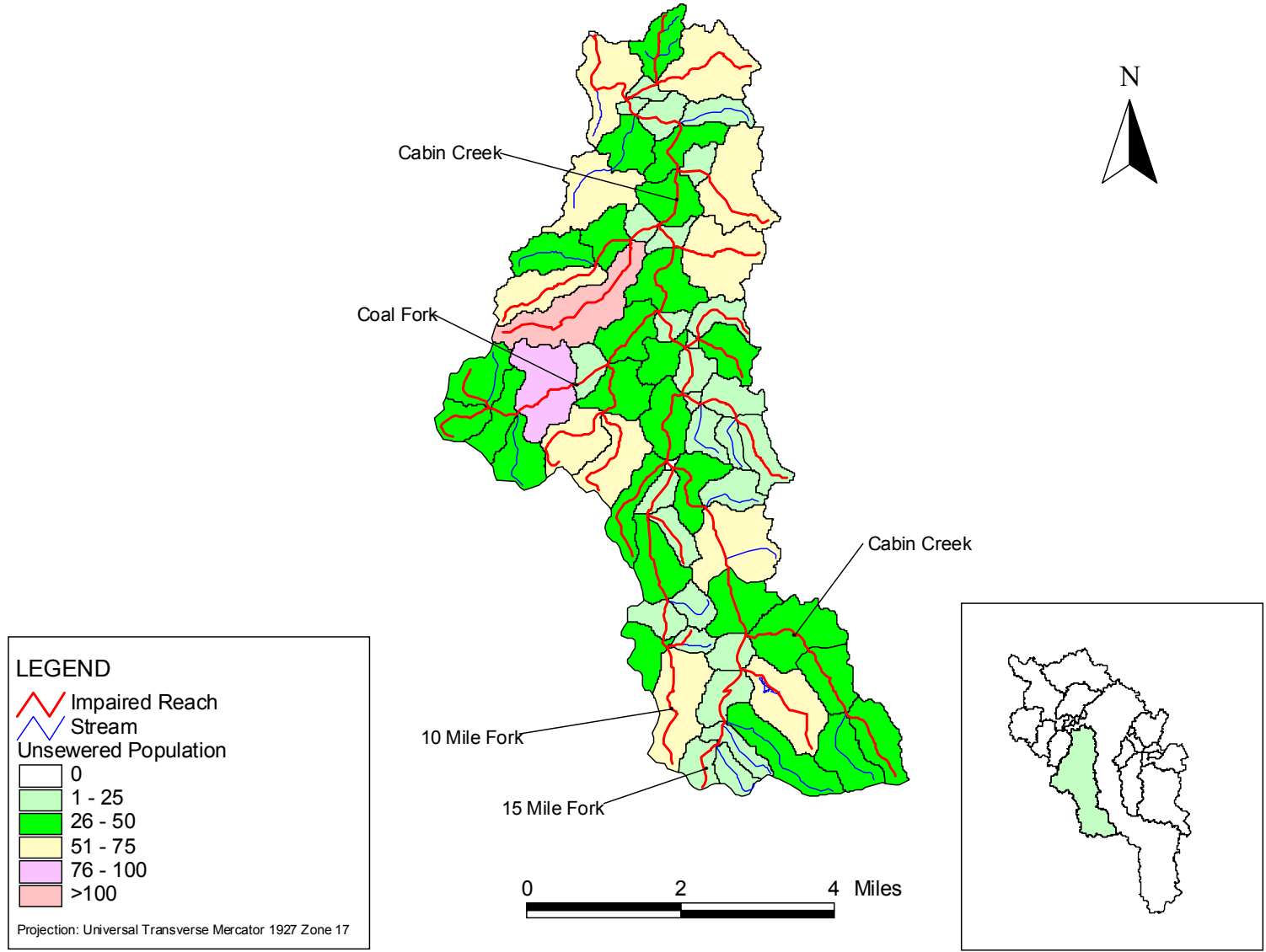


Figure A-3-8. Estimated unsewered population in the Cabin Creek watershed

Stormwater runoff is another potential nonpoint source of fecal coliform bacteria in both residential/urban and rural areas. Runoff from residential areas can deliver the waste of pets and wildlife to the waterbody. Rural stormwater runoff can transport significant loads of bacteria from livestock pastures, livestock and poultry feeding facilities, and manure storage and application. In the Cabin Creek watershed, there were isolated areas where dogs were confined near a stream. Cattle, horses, and other agricultural livestock were not found in the area.

Given the small portion of total land area in the Upper Kanawha watershed that consists of residential and agricultural areas, and the low fecal coliform bacteria accumulation rates for forested areas, stormwater runoff from these areas is not considered to be a significant nonpoint source of fecal coliform bacteria, except in localized areas.

A certain “natural background” contribution of fecal coliform bacteria can be attributed to deposition by wildlife in forested areas. Accumulation rates for fecal coliform bacteria in forested areas were developed using reference numbers from past TMDLs, incorporating wildlife estimates obtained from WVDEP’s Division of Natural Resources. Although wildlife contributions of fecal coliform bacteria were considered in modeling, they were not found to be a significant source.

### A-3.5 Stressors of Biologically Impaired Streams

The Cabin Creek watershed has nine biologically impaired streams for which TMDLs have been developed. These streams are identified in Table A-3-3 along with the primary stressors of the streams’ benthic communities and the TMDLs required to address these impairments. A stressor identification process was used to evaluate and identify the primary stressors of impaired benthic communities. Refer to the main report for a detailed description of the stressor identification process. WVDEP is deferring TMDL development for two other biologically impaired waters in the Cabin Creek watershed (Wet Branch and Coal Fork). The primary stressor in those waters is elevated ionic strength. The information available on the causative pollutant(s) and associated impairment threshold(s) is insufficient to support TMDL development at this time.

**Table A-3-3.** Primary stressors of biologically impaired streams in the Cabin Creek watershed

| Stream                                | Primary Stressors   | TMDLs Required  |
|---------------------------------------|---|---|
| Cabin Creek                           | Metals toxicity (Al, Fe)<br>Acidity (pH)<br>Sedimentation<br>Organic enrichment | Aluminum<br>Iron<br>pH<br>Sediment<br>Fecal coliform bacteria |
| Coalburg Branch                       | Aluminum toxicity<br>Acidity (pH)   | Aluminum<br>pH  |
| Left Fork of Long Bottom Creek        | Sedimentation   | Sediment  |
| Laurel Fork of Coal Fork              | Metals toxicity (Al, Fe)<br>Sedimentation                                       | Aluminum<br>Iron<br>Sediment                                  |
| Left Fork of Laurel Fork of Coal Fork | Metals toxicity (Al, Fe)<br>Sedimentation                                       | Aluminum<br>Iron<br>Sediment                                  |

| Stream                           | Primary Stressors                                       | TMDLs Required                            |
|----------------------------------|---|---|
| Bear Hollow                      | Aluminum toxicity<br>Acidity (pH)<br>Organic enrichment | Aluminum<br>pH<br>Fecal coliform bacteria |
| Unnamed tributary of Bear Hollow | Aluminum toxicity<br>Acidity (pH)<br>Organic enrichment | Aluminum<br>pH<br>Fecal coliform bacteria |
| Cane Fork                        | Metals toxicity (Al, Fe)<br>Acidity (pH)                | Aluminum<br>Iron<br>pH                    |
| 10 Mile Fork                     | Metals toxicity (Al, Fe)<br>Sedimentation               | Aluminum<br>Iron<br>Sediment              |

The iron and aluminum TMDLs presented in Tables A-3-4 and A-3-6 address the metals toxicity biological stressors; the fecal coliform bacteria TMDLs presented in Table A-3-8 are surrogates for the organic enrichment biological stressor. Please refer to sections A-3.3 and A-3.4 for source information.

### A-3.6 TMDLs for the Cabin Creek Watershed

#### A-3.6.1 TMDL Development

TMDLs and source allocations were developed for impaired streams in the Cabin Creek watershed. A top-down methodology was followed to develop these TMDLs and allocate loads to sources. Headwaters were analyzed first because they have a profound effect on downstream water quality. Loading contributions were reduced from applicable sources for these waterbodies and TMDLs were developed. Refer to section 7.4 of the main report for a detailed description of allocation methodologies used in the development of the pollutant-specific TMDLs.

The TMDLs for iron, manganese, aluminum, pH, fecal coliform bacteria, and sediment are shown in Tables A-3-4 through A-3-9. The TMDLs for iron, manganese, and aluminum are presented as annual average loads, in terms of pounds per year. The TMDLs for sediment are presented in terms of tons per year. The TMDLs for fecal coliform bacteria are presented in terms of number of colonies per year. All TMDLs are presented as average annual loads because they were developed to meet TMDL endpoints under a range of conditions observed throughout the year.

As stated in Section 7.4.1, a surrogate approach was used to develop pH TMDLs. It was assumed that reductions in metals concentrations to TMDL endpoints would result in compliance with the pH water quality standard. To verify this assumption, the Dynamic Equilibrium In-stream Chemical Reactions (DESC-R) model was run for an extended period under TMDL conditions—conditions where TMDL endpoints for metals were met. A median equilibrium pH was calculated based on the daily equilibrium pH output from the DESC-R model. The results, shown in Table A-3-7, are the TMDLs for the pH-impaired streams in the watershed. Refer to the Technical Report for a detailed description of the pH modeling approach.



### A-3.6.2 TMDL Tables: Metals

Table A-3-4. Iron TMDLs for the Cabin Creek watershed

| Major Watershed | Stream Code | Stream Name              | Metal | Load Allocation (lb/yr) | Wasteload Allocation (lb/yr) | Margin of Safety (lb/yr) | TMDL (lb/yr) |
|-----------------|-------------|--------------------------|-------|-------------------------|------------------------------|--------------------------|--------------|
| CABIN CREEK     | K-61        | Cabin Creek              | Iron  | 178,600                 | 79,295                       | 13,573                   | 271,468      |
| CABIN CREEK     | K-61-B      | Dry Branch               | Iron  | 5,601                   | 4,466                        | 530                      | 10,596       |
| CABIN CREEK     | K-61-E      | Paint Branch             | Iron  | 2,913                   | NA                           | 153                      | 3,066        |
| CABIN CREEK     | K-61-H-1    | Laurel Fork of Coal Fork | Iron  | 11,264                  | 5,054                        | 859                      | 17,177       |
| CABIN CREEK     | K-61-H-1-A  | Left Fork/Laurel Fork*   | Iron  | 2,006                   | 3,200                        | 260                      | 5,466        |
| CABIN CREEK     | K-61-H-3    | UNT/Coal Fork            | Iron  | 2,633                   | 393                          | 159                      | 3,186        |
| CABIN CREEK     | K-61-J      | Cane Fork                | Iron  | 7,921                   | 10                           | 417                      | 8,349        |
| CABIN CREEK     | K-61-L      | 10 Mile Fork             | Iron  | 24,480                  | 28,359                       | 2,781                    | 55,620       |
| CABIN CREEK     | K-61-L-5    | 10th UNT/10 Mile Fork    | Iron  | 994                     | NA                           | 52                       | 1,046        |
| CABIN CREEK     | K-61-O      | 15 Mile Fork             | Iron  | 15,212                  | 23,729                       | 2,049                    | 40,990       |
| CABIN CREEK     | K-61-O-1    | Abbott Creek             | Iron  | 2,190                   | 1,401                        | 189                      | 3,780        |

NA = not applicable; UNT = unnamed tributary.

\* Indicates TMDL developed to address biological impairment.

**Table A-3-5. Manganese TMDLs for the Cabin Creek watershed**

| Major Watershed | Stream Code | Stream Name              | Metal     | Load Allocation (lb/yr) | Wasteload Allocation (lb/yr) | Margin of Safety (lb/yr) | TMDL (lb/yr) |
|-----------------|-------------|--------------------------|-----------|-------------------------|------------------------------|--------------------------|--------------|
| CABIN CREEK     | K-61        | Cabin Creek              | Manganese | 67,440                  | 55,540                       | 6,473                    | 129,453      |
| CABIN CREEK     | K-61-H-1    | Laurel Fork of Coal Fork | Manganese | 3,655                   | 3,158                        | 359                      | 7,172        |
| CABIN CREEK     | K-61-H-3    | UNT/Coal Fork            | Manganese | 931                     | 246                          | 62                       | 1,239        |
| CABIN CREEK     | K-61-I-1    | 1st UNT/Bear Hollow      | Manganese | 335                     | NA                           | 18                       | 353          |
| CABIN CREEK     | K-61-J      | Cane Fork                | Manganese | 3,811                   | 6                            | 201                      | 4,019        |
| CABIN CREEK     | K-61-O      | 15 Mile Fork             | Manganese | 18,765                  | 16,185                       | 1,839                    | 36,789       |
| CABIN CREEK     | K-61-O-1    | Abbott Creek             | Manganese | 527                     | 1,212                        | 92                       | 1,831        |

NA = not applicable; UNT = unnamed tributary.

**Table A-3-6.** Aluminum TMDLs for the Cabin Creek watershed

| Major Watershed | Stream Code | Stream Name              | Metal          | Load Allocation (lb/yr) | Wasteload Allocation (lb/yr) | Margin of Safety (lb/yr) | TMDL (lb/yr) |
|-----------------|-------------|--------------------------|----------------|-------------------------|------------------------------|--------------------------|--------------|
| CABIN CREEK     | K-61        | Cabin Creek              | Total Aluminum | 127,118                 | 64,027                       | 10,060                   | 201,205      |
| CABIN CREEK     | K-61-B-1    | Coalburg Branch          | Total Aluminum | 1,221                   | 3,037                        | 224                      | 4,482        |
| CABIN CREEK     | K-61-H      | Coal Fork                | Total Aluminum | 19,928                  | 6,095                        | 1,370                    | 27,392       |
| CABIN CREEK     | K-61-H-1    | Laurel Fork of Coal Fork | Total Aluminum | 7,793                   | 3,200                        | 579                      | 11,571       |
| CABIN CREEK     | K-61-H-1-A  | Left Fork/Laurel Fork*   | Total Aluminum | 2,006                   | 3,200                        | 260                      | 5,466        |
| CABIN CREEK     | K-61-H-3    | UNT/Coal Fork            | Total Aluminum | 1,594                   | 249                          | 97                       | 1,941        |
| CABIN CREEK     | K-61-I      | Bear Hollow              | Total Aluminum | 2,611                   | NA                           | 137                      | 2,748        |
| CABIN CREEK     | K-61-I-1    | 1st UNT/Bear Hollow      | Total Aluminum | 1,078                   | NA                           | 57                       | 1,135        |
| CABIN CREEK     | K-61-J      | Cane Fork                | Total Aluminum | 5,602                   | 7                            | 295                      | 5,904        |
| CABIN CREEK     | K-61-K      | Toms Fork                | Total Aluminum | 866                     | 2,136                        | 158                      | 3,160        |
| CABIN CREEK     | K-61-L      | 10 Mile Fork             | Total Aluminum | 11,550                  | 26,037                       | 1,978                    | 39,566       |
| CABIN CREEK     | K-61-L.5    | 1st UNT/10 Mile Fork     | Total Aluminum | 514                     | NA                           | 27                       | 541          |
| CABIN CREEK     | K-61-O      | 15 Mile Fork             | Total Aluminum | 16,452                  | 17,615                       | 1,793                    | 35,860       |
| CABIN CREEK     | K-61-O-1    | Abbott Creek             | Total Aluminum | 1,928                   | 1,365                        | 173                      | 3,467        |

NA = not applicable; UNT = unnamed tributary.

\* Indicates TMDL developed to address biological impairment.

**Table A-3-7.** pH TMDLs for the Cabin Creek watershed

| Major Watershed | Stream Code | Stream Name     | Parameter | pH* (Under TMDL conditions) |
|-----------------|-------------|-----------------|-----------|-----------------------------|
| CABIN CREEK     | K-61        | Cabin Creek     | pH        | 7.37                        |
| CABIN CREEK     | K-61-B-1    | Coalburg Branch | pH        | 7.23                        |

**Table A-3-7.** (continued)

| Major Watershed | Stream Code | Stream Name         | Parameter | pH*<br>(Under TMDL conditions) |
|-----------------|-------------|---------------------|-----------|--------------------------------|
| CABIN CREEK     | K-61-G      | Greens Branch       | pH        | 7.47                           |
| CABIN CREEK     | K-61-I      | Bear Hollow         | pH        | 7.47                           |
| CABIN CREEK     | K-61-I-1    | 1st UNT/Bear Hollow | pH        | 7.45                           |
| CABIN CREEK     | K-61-J      | Cane Fork           | pH        | 7.36                           |
| CABIN CREEK     | K-61-O      | 15 Mile Fork        | pH        | 7.42                           |
| CABIN CREEK     | K-61-O-1    | Abbott Creek        | pH        | 7.42                           |

UNT = unnamed tributary.

\*Predicted pH assumes that all metals (aluminum, iron, manganese) meet TMDL endpoints.

### A-3.6.3 TMDL Tables: Fecal Coliform Bacteria

**Table A-3-8.** Fecal coliform bacteria TMDLs for the Cabin Creek watershed

| Major Watershed | Stream Code | Stream Name         | Parameter      | Load Allocation<br>(counts/yr) | Wasteload Allocation<br>(counts/yr) | Margin of Safety<br>(counts /yr) | TMDL<br>(counts /yr) |
|-----------------|-------------|---------------------|----------------|--------------------------------|-------------------------------------|----------------------------------|----------------------|
| CABIN CREEK     | K-61        | Cabin Creek         | Fecal coliform | 2.07E+14                       | 3.32E+09                            | 1.09E+13                         | 2.18E+14             |
| CABIN CREEK     | K-61-B      | Dry Branch          | Fecal coliform | 7.05E+12                       | NA                                  | 3.71E+11                         | 7.42E+12             |
| CABIN CREEK     | K-61-F      | Longbottom          | Fecal coliform | 9.93E+12                       | NA                                  | 5.23E+11                         | 1.05E+13             |
| CABIN CREEK     | K-61-G      | Greens Branch       | Fecal coliform | 6.63E+12                       | NA                                  | 3.49E+11                         | 6.98E+12             |
| CABIN CREEK     | K-61-I      | Bear Hollow         | Fecal coliform | 2.71E+12                       | NA                                  | 1.43E+11                         | 2.85E+12             |
| CABIN CREEK     | K-61-I-1    | 1st UNT/Bear Hollow | Fecal coliform | 8.29E+11                       | NA                                  | 4.36E+10                         | 8.72E+11             |

NA = not applicable; UNT = unnamed tributary.

### A-3.6.4 TMDL Tables: Sediment

**Table A-3-9.** Sediment TMDLs for the Cabin Creek watershed

| Major Watershed | Stream Code | Stream Name                   | Parameter | Load Allocation (tons/yr) | Wasteload Allocation (tons/yr) | Margin of Safety (tons/yr) | TMDL (tons/yr) |
|-----------------|-------------|-------------------------------|-----------|---------------------------|--------------------------------|----------------------------|----------------|
| CABIN CREEK     | K-61        | Cabin Creek                   | Sediment  | 4,696                     | 620                            | 280                        | 5,596          |
| CABIN CREEK     | K-61-F-1    | Left Fork of Longbottom Creek | Sediment  | 248                       | NA                             | 13                         | 261            |
| CABIN CREEK     | K-61-H-1    | Laurel Fork                   | Sediment  | 670                       | 68                             | 39                         | 777            |
| CABIN CREEK     | K-61-H-1-A  | Left Fork/Laurel Fork         | Sediment  | 252                       | 56                             | 16                         | 324            |
| CABIN CREEK     | K-61-L      | 10 Mile Fork                  | Sediment  | 70                        | 56                             | 7                          | 133            |

NA = not applicable.