Review of a
Petition to Redesignate
Tributaries to South Fork Tenmile Creek
From HQ-WWF to WWF

Center and Jackson Townships
Greene County, Pennsylvania

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I EXECUTIVE SUMMARY

The upper South Fork Tenmile Creek (SFTC) basin was designated High Quality-Warm Water Fishes (HQ-WWF) by the Pennsylvania Department of Environmental Protection (PADEP) in 1979. Subsequent confirmations that the streams were attaining their HQ-WWF designated uses have been recorded by sampling throughout the basin. A redesignation to Warm Water Fishes (WWF) of several sections of tributaries to the upper SFTC (specifically parts of House Run, Hoge Run, and McCourtney Run; the "Petition Area") is unnecessary, inappropriate, unwarranted, and would be contrary to federal and State laws (Clean Water Act, Clean Streams Law).

Representative in-stream biological data collected and evaluated by PADEP during the past three decades demonstrate that streams within the upper SFTC basin (including the above-named tributaries) consistently were attaining their HQ designated uses according to the methods and standards in use at the times of assessment. Recent sampling (Stout 2009) demonstrates that streams within and near the Petition Area currently are meeting the criteria for High Quality (HQ) existing use, and in some places are meeting the criteria for Exceptional Value (EV) existing use. The application of cost-effective and reasonable best management practices (BMPs) to existing nonpoint sources could provide water quality improvements, so that any sections of the subject tributaries which may not currently be meeting HQ criteria could once again achieve HQ conditions, provided that additional degradation of streams in the watershed is not allowed.

Small, forested tributaries such as those in the Petition Area play a crucial role in maintaining and protecting the quality of water and ecosystems in downstream waterways. Redesignation to WWF would facilitate additional discharges which could preclude any water quality improvements in these streams in the future, could adversely affect species of special concern, and could endanger the quality of HQ waters downstream. For these reasons, the HQ-WWF designation of these tributaries must be retained and implemented by appropriate controls on any future discharges and stream modifications proposed for mining or other activities throughout the Petition Area. In addition, PADEP must identify the existing EV use of streams in the Petition Area which currently are unrecognized, prior to any future decisions on permits for discharges or encroachments. Finally, PADEP and other entities must undertake outreach to residents of this Environmental Justice Area to assist in the implementation of BMPs for nonpoint sources to address localized instances of water pollution that currently exist.

II INTRODUCTION

During June 2008, Foundation Mining, L.P. (Foundation) submitted a Petition to the Pennsylvania Environmental Quality Board (EQB) requesting redesignation of parts of House Run, Hoge Run, and McCourtney Run (tributaries to the SFTC) in Center and Jackson Townships, Greene County. Foundation contends that these watercourses

currently do not meet applicable PADEP standards for *de novo* classification as "Special Protection" waters, and thus requested that they be redesignated from High Quality - Warm Water Fishes (HQ-WWF) to Warm Water Fishes (WWF).

Citizens for Pennsylvania's Future, Center for Coalfield Justice, and Mountain Watershed Association retained Schmid & Company to evaluate whether the Petition should be granted and whether any basis exists for redesignating these waterways to WWF. For the reasons set forth in this report, we conclude that:

1. the Foundation Petition should be denied by the EQB,
2. at a minimum, these waterways should retain their existing HQ-WWF use, which was properly designated by PADEP in 1979, and
3. most sections of these waterways should be redesignated EV after appropriate confirmation of existing use by PADEP and prior to approval of any future permits to discharge into or encroach upon the waterways in and adjacent to the Petition Area.

Meanwhile, local landowners should be encouraged to install Best Management Practices to control nonpoint sources of pollution and to utilize grant funds available to assist in efforts to restore water quality to its historic Special Protection level. For its part, PADEP should undertake new stream inventory/assessments in the upper SFTC watershed to identify all streams with EV existing use.

III PETITION AREA LOCATION AND DESCRIPTION

Foundation's Petition Area is in Center and Jackson Townships in the west-central section of Greene County in southwestern Pennsylvania (Figure 1). It is within a part of Greene County that has been designated an Environmental Justice Area by PADEP. An Environmental Justice (EJ) Area is defined as one where 20% or more of the population is in poverty or 30% or more of the population is non-white. PADEP recognizes that there may be barriers to public participation in EJ areas and is supposed to promote outreach to residents of such areas in the development, implementation, and enforcement of environmental laws, regulations, and policies.

The Petition Area comprises sections of House Run, Hoge Run, and McCourtney Run, encompassing 2,462 acres (3.85 square miles) within the upper section of the SFTC watershed (Figure 2). South Fork Tenmile Creek begins near Rutan at the confluence of Grays Fork and Claylick Run/Jacob Run in northwestern Greene County at approximately elevation 1,025 feet NGVD (National Geodetic Vertical Datum). It flows generally eastward to Waynesburg and then northeastward to its mouth at Clarksville, where it joins Tenmile Creek at approximately elevation 790 feet. The Tenmile Creek watershed (PA Subbasin Number 19B) occupies 380 square miles within the Monongahela River basin, which in turn has a drainage area of 2,735 square miles in Pennsylvania. The Monongahela River, which meets the Allegheny River at Pittsburgh to form the Ohio River, drains 7,340 square miles within Maryland, Pennsylvania, and West Virginia. Its flow eventually reaches the Gulf of Mexico via the Mississippi River.

All of the Hoge Run watershed (951.6 acres), including the mainstem and two unnamed tributaries, is within the Petition's study area (Figure 3). About 543 acres (42%) of McCourtney Run's 1,304-acre watershed are in the study area. About 965 acres (32%) of House Run's 3,016-acre watershed, including part of the mainstem and several unnamed tributaries, are in the study area of the Foundation Petition.

South Fork Tenmile Creek extends approximately 35 miles in total length, and has a drainage area of about 199 square miles. The subject waterways are in the 72 square-mile upper section of the South Fork Tenmile Creek basin where the official use has been designated HQ-WWF since 1979. The upper South Fork Tenmile Creek basin, and the adjacent Browns Creek basin to its north (Figure 4), represent the only recognized High Quality watersheds in Greene County. Downstream from its confluence with Browns Creek near Waynesburg, the designated use of the lower South Fork Tenmile Creek watershed currently is WWF.

The Petition Area is within the unglaciated Pittsburgh Low Plateau Section of the Appalachian Plateaus physiographic province. The Pittsburgh Low Plateau Section consists of a rolling upland surface cut by numerous, narrow, relatively shallow valleys. It is underlain by layers of rock (mainly sandstones and shales) that originated from ancient sediment deposition and compression. The Greene Formation of the Dunkard Group is the near-surface bedrock unit that covers the western half of Greene County. The Dunkard Group is of Permian age, the youngest of the five coal-bearing rock groups of southwestern Pennsylvania (the others - Pottsville, Allegheny, Conemaugh, and Monongahela - are all of Pennsylvanian age). The surface topography of this area is largely defined by stream valleys eroded and downcut over geologic time (Western Pennsylvania Conservancy 2005). Soils mapped throughout the study area are mainly Dormont silt loams and Culleoka silt loams (Seibert *et al*. 1983). PADEP categorizes House Run, Hoge Run, and McCourtney Run as "freestone" streams, *i.e*., they are not limestone or limestone-influenced, nor are they tidal.

IV HQ-WWF DESIGNATION OF SOUTH FORK TENMILE CREEK

High Quality (HQ) and Exceptional Value (EV) waters in Pennsylvania are deemed to be "special protection" waters. In accordance with the definition in 25 *Pa. Code* Chapter 93, *"High Quality Waters"* are *"Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying §93.4b(a)."* The antidegradation requirements of Pennsylvania's surface water quality standards promote the maintenance and protection of existing water quality for HQ and EV waters.

The upper section of the South Fork Tenmile Creek basin was formally "designated" HQ-WWF by the PADEP during the late 1970s after public notice and formal rulemaking. PADEP did not publish a technical support document detailing the basis for its original designation of SFTC. On 4 March 1978, per "Proposed Rulemaking"

published in the *Pennsylvania Bulletin*, the stream use of the "*South Fork Tenmile Creek basin from source to and including Browns* [*Creek basin*]*"* was proposed to be revised from *"WWF to HQ-WWF"*. Following review of public comments, on 8 September 1979, per "Rules and Regulations" published in the *Pennsylvania Bulletin*, the "*South Fork Tenmile Creek, Basin from source to Browns Creek"*, had the following final listing for Water Uses Protected: "*HQ-WWF"*. House Run, Hoge Run, McCourtney Run, and the balance of the upper South Fork Tenmile Creek watershed to its confluence with Browns Creek, as well as the Browns Creek watershed itself (see Figures 4 and 5), have retained the HQ-WWF designation ever since.

During the past three decades PADEP has conducted stream assessments on numerous representative streams within the upper SFTC basin using various protocols and metrics. The purpose of those assessments was to determine whether the streams were attaining their designated uses. Data collected by PADEP between September 1972 and July 2006 at 17 locations throughout the upper SFTC basin (A through Q on Table 1 and Figure 6) demonstrate that those waterways consistently were attaining HQ-level uses at the times they were assessed. In most cases, healthy and diverse macroinvertebrate and fish communities were observed, and water chemistry was found to be good to excellent throughout the watershed. In every case, the streams were determined by PADEP to be meeting their designated (*i.e.,* HQ) uses. In the latest Pennsylvania Integrated Water Quality Monitoring and Assessment Report (PADEP 2008a), all of the streams within the upper South Fork Tenmile Creek watershed are listed as "attaining" their designated uses, and none was found to be "impaired".

V PETITION TO REDESIGNATE SOUTH FORK TENMILE CREEK

During February 2008, Foundation Mining submitted a petition to PADEP to redesignate the entire HQ-WWF section of South Fork Tenmile Creek to WWF, based on water quality sampling collected during June 2007 at four stations within the 72 square mile watershed. That petition was either withdrawn by Foundation or returned by PADEP as incomplete prior to formal consideration by the EQB.

On 29 and 30 April 2008, sections of House Run, Hoge Run, and McCourtney Run were sampled by Wallace & Pancher, Inc., on behalf of Foundation Mining. During June 2008, Foundation submitted a Petition to the EQB to redesignate sections of House Run, Hoge Run, and McCourtney Run (totaling 3.85 square miles) from HQ-WWF to WWF. At its meeting on 19 August 2008, the EQB determined that the Petition was administratively complete and accepted the Petition for further study under 25 *Pa. Code* Chapter 23 (EQB 2008).

Foundation noted that it was pursuing the Petition in conjunction with its application for permits for a new underground longwall coal mine. The proposed Foundation Mine would include discharges to surface waters within the Petition Area. Such discharges would need to satisfy more stringent PADEP restrictions if they were to occur in a Special Protection waterway than in a stream designated WWF. Foundation proposes

initially to undermine nearly 15 square miles in an area of Greene County which previously has not been mined and where the streams primarily are designated HQ-WWF (Figure 7).

The Foundation Petition states in support of its request that a surface water intake farther downstream on SFTC, which formerly served the Waynesburg public drinking water supply, no longer exists. It claims also that its recent sampling of water chemistry, aquatic community, and in-stream habitat show that the subject streams do not meet the current PADEP standards for designating a stream as HQ when compared with UNT to Sugarcamp Run (a HQ-WWF stream) in Washington County, approximately 25 miles to the northwest (Figure 8).

PADEP reportedly has conducted its own sampling recently of water chemistry, benthic macroinvertebrates, and in-stream habitat along sections of House Run, Hoge Run, and McCourtney Run in response to the Petition. The PADEP results have not yet been made public. PADEP also reportedly sampled an unnamed tributary to North Fork Dunkard Fork in Ryerson Station State Park as its reference stream. That stream, just outside the SFTC watershed about 6 miles to the west of the subject streams, had been determined by PADEP to be a "reference quality" EV stream during April 2008.

VI FEDERAL AND STATE WATER QUALITY GOALS AND STANDARDS

The stated objective of the Clean Water Act (CWA) is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" (33 *U.S.C.* 1251 *et seq*.). Water quality standards are the foundation of the program mandated by the CWA. Section 303 of the CWA directs States and Indian Tribes, with EPA oversight, to adopt water quality standards, to assign designated uses, to set criteria to protect those uses, and to establish an antidegradation policy.

Like the CWA, the intent of the Pennsylvania Clean Streams Law is to preserve and improve the purity of the waters of the Commonwealth for the protection of public health, animal life, aquatic life, and other beneficial uses. The Pennsylvania water quality standards and antidegradation policy are defined at 25 *Pa. Code* Chapter 93. The Chapter 93 regulations define how "Special Protection" waters qualify as HQ or EV, describe the implementation of antidegradation requirements, and define the degree of degradation that a waterbody may incur without causing a loss of a use. Several PADEP protocols specify the detailed methods currently used for stream analysis.

VII THE SUBJECT STREAMS CURRENTLY ATTAIN THEIR HQ-WWF DESIGNATED USES OR HIGHER (EV) USES

Existing uses are defined in 25 *Pa. Code* §93.1 as

> "*those uses actually attained in the waterbody on or after November 28, 1975, whether or not those uses have been included in the water quality standards*".

According to the PADEP Antidegradation Implementation Guidance (PADEP 2003):

"Existing uses are different than designated uses in several ways. First, while a designated use is a regulation that is the product of a rulemaking process, an existing use is a DEP classification for a stream based on valid technical information for a surface water that DEP has reviewed. The designated use of a surface water may not be lowered to a use that is less stringent than the existing use for the water".

(a) The results of recent sampling indicate that the existing use of the subject waterways is, at *minimum*, HQ-WWF.

The first and most compelling reason to retain the current HQ-WWF designation of House Run, Hoge Run, and McCourtney Run is that recent sampling and assessment of macroinvertebrates indicate that those waterways currently are attaining their designated use or higher uses. Consequently, not only is the HQ-WWF designation of the subject waterways not more restrictive than the existing use, but in places it appears to be less restrictive.

According to the redesignation Petition, the predominant land uses in the study area are forest (77%) and farmland (21%), with other uses (transportation, low-density urban/commercial, and barren/unclassified) occupying the remainder (Figure 9). Streams in watersheds with a high proportion of forest cover and a low proportion of impervious cover, where development and other disturbances have been minimal, generally have the highest quality water (Carlson 2004).

Sampling during March and April 2009 (Figure 10) by Dr. Benjamin M. Stout III (2009) demonstrates that most of the streams in and near the Petition Area currently meet the requirements for at least HQ-WWF existing use. In three locations, Dr. Stout's sampling demonstrates that the streams currently meet the requirements for EV existing use, and so the current HQ designation actually may be *less* restrictive than necessary to protect existing uses (Figure 11).

On 28 March and 17 April 2009, Dr. Stout sampled six stream stations in or near the Petition study area, and on 29 March 2009 he sampled two locations along a nearby EV reference stream (UNT to North Fork Dunkard Fork). Dr. Stout found that five of his candidate stream samples (Sites 1, 2, 3, 7, and 8) had scores greater than the 83% minimum needed to qualify as HQ (each scored 90% or higher) in comparison to Site 5, the downstream location on the reference stream. Three of those locations (Sites 1, 3, and 8) had scores greater than the 92% minimum needed to qualify as EV (all three scored 100% in comparison to the Site 5 reference). Only Site 4 (at the mouth of Hoge Run) failed to qualify as either HQ or EV, scoring 35% in comparison to the Site 5 reference.

Dr. Stout also collected samples along a reach (Site 6) farther upstream along the EV reference stream where the contributory watershed is 41 acres (versus 198 acres at the downstream Site 5). This upstream reference site is believed to be more

representative of the many small headwater tributaries under evaluation in the Petition Area. When compared with the Site 6 reference, five of the six locations sampled on the candidate streams scored greater than the 92% minimum needed to qualify as EV. Only Site 4 failed to qualify as at least HQ, scoring 37.5% in comparison to the Site 6 reference.

Conditions at Site 4 were noticeably different from those at the other sites sampled. The watershed upstream from Site 4 (968 acres) is much larger than at the Site 5 reference (198 acres) or at any of the other sampled locations (which range from 155 acres at Site 2, to 35 acres at Site 1). Site 4 currently suffers from poor land management practices, in particular, active horse and cattle pastures immediately adjacent to the streambanks which in some places provide unlimited access by livestock to the stream channel itself. This situation results in increased sediment and nutrient loads in the stream. A dominance of midges and other pollution-tolerant species was found at Site 4, in sharp contrast to the other sampling sites. Nevertheless, eight different taxa with very low pollution tolerance values (Hilsenhoff scores of 0 or 1, where the range is from 0 [intolerant] to 10 [tolerant]), were identified by Dr. Stout at Site 4 despite its less favorable localized conditions. This suggests that the degradation at Site 4 could be reversed with proper land management practices, given the availability of higher-quality organisms for recolonization.

Section 93.4a(b) provides that "*existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected*." The same protection standard appears in the federal antidegradation regulations at 40 *CFR* Part 131.12(a)(1). At minimum, the HQ designated use of the subject streams, along with their HQ existing use demonstrated by sampling and assessment data collected by Dr. Stout, must be protected. Additionally, PADEP should confirm that certain sections of these streams should appropriately be upgraded to reflect their existing EV use, and should protect them accordingly.

(b) The results of this recent sampling reaffirm the results of historical PADEP sampling in and near the subject waterways and of other sections of the upper SFTC watershed.

As noted above, PADEP has conducted biological assessments on streams throughout the upper SFTC during the past three decades. It consistently found that the waterways were attaining HQ-level uses at the times they were assessed. One of its sampling points ("M" on Figure 6 and Table 1) was on McCourtney Run within the Foundation Petition Area. In its 2001 sampling on McCourtney Run, DEP found that the macroinvertebrate community was dominated by families with Hilsenhoff scores of 5 or less, and six or more families had Hilsenhoff scores of 4 or less. DEP concluded that this stream was "not impaired". Throughout the upper SFTC watershed, healthy and diverse macroinvertebrate and fish communities were observed, and water chemistry was found to be good to excellent. In the latest statewide Assessment Report (PADEP 2008a), all of the streams within the upper

South Fork Tenmile Creek watershed are listed as “attaining” their designated uses, and none was found to be “impaired”.

Because its in-stream data document that the streams of the upper SFTC watershed have been consistently attaining at least the use of HQ-WWF subsequent to 28 November 1975, their designated use properly was and remains HQ-WWF. On the basis of 2009 sampling, it is clear that many streams in the SFTC watershed warrant further sampling by PADEP to confirm their EV existing use, followed by formal redesignation to EV.

VIII ADDITIONAL CONSIDERATIONS

In addition to the recent and historical sampling of streams in and near the Petition Area, there are other reasons for retaining the HQ-WWF designated use of the subject streams, or for redesignating certain sections of the streams to EV existing use.

(a) The designated HQ use of any sections of House Run, Hoge Run, or McCourtney Run that currently may be <u>not</u> attaining that standard can be achieved by implementing cost-effective and reasonable BMPs (best management practices) for non-point source control.

Sampling by Stout (2009) identified that neither HQ or EV current-threshold conditions currently are being met at one station. At Station 4 (mouth of Hoge Run), the assessment score was less than half of the score at any of the other stations. Station 4 represents a much larger watershed (968 acres) than either the reference stream (Station 5 - 198 acres) or any of the other stations. Station 4 also was noticeably affected by poor land management practices associated with a pasture along its bank.

The Petitioner also had obtained its lowest assessment scores in areas near active pastures and adjacent to residential and commercial uses. Improvements in water quality were observed by the Petitioner, however, where land management practices were better, even over a relatively short distance downstream from the low-scoring station. For example, at Petitioner Station HQ1 on House Run, where one bank was a bare, active cattle pasture with unimpeded livestock access to the stream channel, the score obtained was 43% of the Petitioner’s reference stream. By contrast, Station HQ2 (approximately 3,000 feet downstream from HQ1; see Figure 11) had tall grasses lining the channel of an inactive pasture, with some riparian forest just upstream; there the score was 73% of the reference stream - a significant improvement over a very short distance.

If conditions in the lower sections of House Run and McCourtney Run do not meet the 83% minimum needed to qualify as HQ currently, there is every reason to believe that the implementation of simple, cost-effective BMPs and other institutional and legal controls would improve water quality. There are several

specific BMPs in the State's current Stormwater Manual (PADEP 2006) which would be appropriate for these streams, either individually or in combination:

BMP 5.4.2 "Protect/Conserve/Enhance Riparian Areas" This non-structural BMP is rated "very high" for its water quality functions. It could be applied to the existing forest buffer along House Run, Hoge Run, and McCourtney Run.

BMP 6.7.1 "Riparian Buffer Restoration" This structural BMP is rated "medium/high" for its water quality functions. It could be applied along the sections of House Run, Hoge Run, and McCourtney Run where the forest buffer has been removed altogether to allow agricultural activity.

BMP 6.7.2 "Landscape Restoration" This structural BMP is rated "very high" for its water quality functions. It could be applied along sections of House Run, Hoge Run, and McCourtney Run in areas currently used for agricultural or residential purposes.

BMP 6.7.4 "Floodplain Restoration" This structural BMP is rated "medium/high" for its water quality functions. It could be applied throughout the length of House Run, Hoge Run, and McCourtney Run.

Existing local and regional programs and plans promote the use of BMPs and similar measures to protect and preserve sensitive water resources such as House Run, Hoge Run, and McCourtney Run. The Greene County Comprehensive Plan (Greene County Planning Commission 2008) specifically identifies a Riparian Buffer along South Fork Tenmile Creek waterways that are designated HQ-WWF in recognition of their significant water quality status. Similarly, the Greene County Greenways Plan (Mackin 2006) notes that "the restoration or development of riparian forest buffers along these waterways will serve to improve water quality, restore important habitat, and reduce negative impacts from high water events". The 2008 Comprehensive Plan identifies specific "implementation strategies" to protect and improve water quality that are relevant to House Run, Hoge Run, and McCourtney Run, including the following:

- Adopt a County Riparian Buffer policy that aligns with the Commonwealth's criteria for streamside buffer restoration,
- Develop a model Riparian (Stream) Buffer Ordinance for use by Greene County municipalities.
- Support efforts to identify critical waterways and designate them as unsuitable for mining under the Department of Environmental Protection.
- Continue the regional partnership with Washington County to prepare a Rivers Conservation Plan for the Ten Mile Creek watershed, involving the Ten Mile Creek Watershed Conservancy.
- Update the Greene County Subdivision and Land Development Ordinance (SALDO) to provide better protection for waterways and natural resource areas from the impact of future development.

The implementation of localized measures such as these likely would help any stream segment not currently meeting its designated use to meet that use. For that reason, it would not be appropriate to redesignate to a less restrictive use even those localized stream segments that may not presently be meeting their designated uses (25 *Pa. Code* § 93.4(b)). Residents of this Environmental Justice Area may need technical and financial assistance to implement appropriate BMPs. The Greene County Conservation District, the Foundation for Pennsylvania Watersheds, the Western Pennsylvania Conservancy, and similar organizations periodically provide funding to local groups for such activities as stream bank restoration and riparian corridor improvements.

(b) Maintenance of the designated HQ-WWF use of House Run, Hoge Run, and McCourtney Run is important to protect in-stream and downstream water quality as well as species of special concern within the Petition Area itself.

Headwater streams such as House Run, Hoge Run, and McCourtney Run occupy a crucial position within the SFTC basin, and they provide important ecological benefits both within their watersheds and to downstream HQ waters.

(i) Redesignating the HQ-WWF use of House Run, Hoge Run, and McCourtney Run to the less restrictive use of WWF could preclude the possibility of improving in-stream and downstream conditions, and could lead to declines in water quality.

According to the minutes of the 19 August 2008 EQB meeting at which the Foundation Petition was considered: "*Mr. Hoffnar further inquired if the mining operations conducted in the petition area would improve water quality in the watershed. Mr. Bluedorn* [counsel to Foundation] *responded that while he couldn't say with certainty that the operations would improve water quality, he did confirm that Foundation Mining would comply with the appropriate mining regulations governing their operations*." Given the intentional as well as unintentional impacts that have occurred to streams, wetlands, seeps, and springs throughout Greene and Washington Counties as a result of longwall mine activities "permitted" by PADEP (Schmid and Company, Inc. 2000; Stout 2002, 2004), that vapid response provides little assurance that degradation will be avoided, should the designated use be downgraded.

As explained on the PADEP's website (PADEP 2008b), changes to either an existing use or a designated use may affect existing and future dischargers of wastewater and other pollutants that may impact these streams. Foundation has communicated the intent of developing a new longwall coal mining operation in this area of Greene County, where discharges from mining and other activities currently are limited by the HQ stream designation. PADEP itself acknowledges the damage that mining causes:

> Disturbed lands that have been strip or surface mined, or are underlain by deep mine excavations, are one of the most difficult areas on which to apply stormwater BMPs. [Acid drainage from

coal mines] is considered by most experts to be the single greatest pollution issue in the state, simply because it has no obvious or easy solution. (PADEP 2006, Section 7.5).

To date, most mining activity has occurred outside the HQ watersheds of South Fork Tenmile Creek and Browns Creek (Figure 7). Most mining has occurred in streams designated either TSF (trout stocking fishes) or WWF (warm water fishes). An application for a coal mine discharge to a "special protection" (HQ or EV) waterway requires completion of Module 24 and its associated requirements for greater protection. In addition to stream discharges, however, underground mines cause other impacts to streams, wetlands, and other water resources (e.g., subsidence-related water loss), some of which are not adequately regulated (Schmid & Company Inc. 2000). Thus, if the HQ designation for this section of the South Fork Tenmile Creek watershed is removed, additional discharges and other impacts can be expected to occur from coal mining or other activities, greatly reducing the possibility that the subject streams ever again will attain their present or former HQ uses.

(ii) The Pennsylvania Natural Diversity Index lists three species of concern within the Petition Area.

The Foundation Petition does not address the actual or potential existence of threatened or endangered species, or of other species of special concern located within the study area. Recent searches of the PNDI (Pennsylvania Natural Diversity Index) online database identified at least three potential impacts to species of special concern in Pennsylvania from any future activities in the Petition Area. Habitat for a freshwater mussel known as the Wabash pigtoe (*Fusconaia flavia*) was recorded in the Petition Area. This mussel currently is listed by the PA Fish and Boat Commission (PAFBC) as a "special concern species"; however, it is proposed for listing as "endangered" in the Commonwealth. According to the Pennsylvania Game Commission, freshwater mussels "*are excellent indicators of good water quality and healthy aquatic ecosystems*" (PGC 2002). In addition, the PNDI identified one plant and one butterfly species of concern to the Bureau of Forestry, Pennsylvania Department of Conservation and Natural Resources (PADCNR) within the Petition Area. *Stachys cordata* (Nuttall's hedge-nettle) is a facultative wetland plant listed as "endangered" in Pennsylvania. *Amblyscirtes vialis* (common roadside skipper) is a butterfly listed as a "special concern species".

According to §93.6 (a), "Water may not contain substances attributable to point or nonpoint source discharges in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life." Redesignation to a less restrictive use could facilitate new mining or other development in these watersheds, resulting in degradation of water quality or hydrological impacts which could affect this freshwater mussel, endangered wetland plant, or other species of special concern.

(iii) Headwater streams provide important ecological benefits to downstream waters.

According to 40 *C.F.R.* 131.10(b), the water quality standards of downstream waters also must be taken into consideration by the State when designating uses in a given stream segment or watershed. As headwater streams in the South Fork Tenmile Creek basin, House Run, Hoge Run, and McCourtney Run occupy a crucial position and provide important ecological benefits to downstream HQ waters. Redesignating the protected uses of House Run, Hoge Run, and McCourtney Run to less restrictive uses could adversely affect the attainment and maintenance of the HQ uses of the balance of the South Fork Tenmile Creek basin to Browns Creek.

Stout (2004) describes headwater streams as functionally critical landscape elements based on an ever-increasing scientific literature:

> Headwater streams can be expected to comprise greater than 80% of the total length of the stream network draining a given watershed (Hynes 1970). Headwater streams furnish the majority of habitat available to benthic macroinvertebrates, the base of the aquatic food web. Forest litter sustains the energy and nutrient budgets of Appalachian headwater streams (Fisher & Likens 1973; Likens *et al.* 1970). Headwater streams are considered exceptional sites for energy cycling and nutrient retention within the complex network of forest and stream interrelations (Wallace *et al.* 1997). Leaf shredding is a key activity in headwaters (Cummins *et al*. 1989), and the resulting downstream transport of energy and nutrients helps sustain larger river ecosystems including their fisheries (Vannote *et al*. 1980). The bulk of the energy assimilated by fine particle collectors in large rivers appears to originate from upstream terrestrial ecosystems (Winterbourne *et al*. 1984).

Additional information on the important role played by headwater streams in Pennsylvania and elsewhere is summarized by Stroud Water Research Center (2008), Lowe and Likens (2005), and Meyer et al. (2003).

The loss or degradation of headwater streams such as the subject waterways inevitably entails significant ecosystem-level consequences for downstream waterways and users. Notably, during July 2008, members of the Waynesburg Borough Council expressed concern with the potential adverse effect that redesignation of upstream waterways would have on its plans for active recreational use of South Fork Tenmile Creek, specifically a 23-mile long water trail for canoes and other recreational watercraft (Washington PA *Observer-Reporter*, 16 July 2008).

Once streams in western Pennsylvania have been dewatered or polluted in the short-term by coal mining, they typically remain degraded forever. Restoration or after-the-fact mitigation of damage from mining to streams and other water resources --- if it can be achieved at all --- is more difficult, more costly, and less

effective than efforts to prevent the damage in the first place. To date, the record of coal mining has been an unmitigated disaster for local water resources.

(c) The analysis performed by the Petitioner was flawed.

(i) Procedures used by the Petitioner in evaluating House Run, Hoge Run, and McCourtney Run were not in accordance with PADEP guidance.

According to the antidegradation guidance (PADEP 2003) "*the single, most critical issue* [regarding the antidegradation biological sampling] *is the selection of reference sites*". Reference and candidate sites must have the same, or very similar, natural conditions; should be of the same "type" (freestone, limestone, tidal, etc.); must possess similar gradient and alkalinity; and must be of equal or similar stream orders or drainage areas. Whenever possible, the reference stream used should have an existing or designated use of EV, must have attained that status based upon biological measures, and should be among the best of all EV streams in the Commonwealth. In most redesignation evaluations, the candidate and selected reference streams typically are located in close proximity, are sampled contemporaneously, and are sampled by the same personnel using comparable procedures.

Foundation evaluated the subject streams in comparison with UNT to Sugarcamp Run in Independence Township, Washington County (see Figure 8). Use of data from UNT to Sugarcamp Run as a reference stream is inappropriate for several reasons. First, UNT to Sugarcamp Run has a designated use of HQ-WWF, rather than EV as the PADEP guidance recommends. Second, the data used for UNT to Sugarcamp Run were collected during November 2005 by Civil and Environmental Consultants (Wallace & Pancher 2008a) in conjunction with the Consol Pennsylvania Coal Company petition to redesignate Grinnage Run, whereas the subject streams were sampled during April 2008 by Wallace & Pancher (2008b). Finally, the UNT is located approximately 25 miles from the candidate streams. While this is not an unreasonably large distance, there are two closer streams that would have been better reference candidates in late April 2008. UNT to Owens Run, about 7.5 miles to the northwest, is an EV existing use stream. Also, UNT to North Fork Dunkard Fork (within Ryerson Station State Park) is about 6 miles to the west of the subject streams; it too is an EV existing use stream, reportedly of reference quality.

In contrast to the Petitioner's methodology, Dr. Stout's sampling of candidate and reference streams was contemporaneous and was performed by the same people using the same procedures. Additionally, Dr. Stout used PADEP's reach along UNT to North Fork Dunkard Fork (EV existing use) as his reference Station 5. In accordance with PADEP guidance, Dr. Stout also targeted the most productive reaches of the candidate streams, whereas the sites sampled for the Petition appear to have targeted reaches with less favorable conditions. For comparison with the Petitioner's sites, three of Dr. Stout's stations (Sites 2, 4, and 7)

corresponded with stations (HQ8, HQ6, and HQ4, respectively) used by Wallace & Pancher (2008b). Stout's Site 4, a stream section along an active pasture, yielded comparable results to the Petitioner's Station HQ6, but sampling at the other two overlapping stations did not.

(ii) There is no evidence that a "water supply" use was a key factor in the designated HQ-WWF use of House Run, Hoge Run, and McCourtney Run.

The "remarks" attached to the 4 March 1978 *Pennsylvania Bulletin* listing of the upper South Fork Tenmile Creek basin as HQ-WWF stated: "*Protect the Waynesburg water supply and the excellent smallmouth bass fishery".* This might seem to suggest that the public water supply intake at Waynesburg may have been one factor in this HQ-WWF designation, but clearly there were other factors (including the bass fishery). PWS (potable water supply) is a specific use for which a waterbody may be designated under Chapter 93.

PWS, however, has never been a designated use listed in Chapter 93 for the subject streams (or for any of the South Fork Tenmile Creek watersheds). If PWS was one of several designation factors, it clearly was not the sole basis for the initial designation as HQ-WWF in 1979. The upper South Fork Tenmile Creek waterways since 1979 have always carried the aquatic life use "WWF" and the special protection use "HQ" in their Chapter 93 listings over the years; never PWS use.

Based on numerous assessments during the last three decades (see VII (b) above), PADEP determined that South Fork Tenmile Creek consistently has been attaining HQ status due to in-stream biological considerations, without regard to the Waynesburg or any other Potable Water Supply "use". Thus, the fact that Waynesburg no longer takes its water supply from South Fork Tenmile Creek is not a sufficient basis for downgrading its historic designated, and currently existing, use as HQ-WWF, as indicated by recent biological sampling.

Furthermore, according to the Water Quality Antidegradation Implementation Guidance (PADEP 2003), "*all Pennsylvania waters are designated for use as public water supplies although that use may not be actually attained in all waters*". Just because one water supply plant at Waynesburg was removed from operation subsequent to the HQ designation, that does not preclude another water supply from being activated someday within the South Fork Tenmile Creek watershed. Consequently, the discontinuance of one specific public water supply use on a waterway should have no bearing on the special protection it is afforded based on aquatic life.

Even if "potable water supply" was *one* of the uses historically associated with South Fork Tenmile Creek (and by extension, with the subject tributaries), it was not the *only* use upon which the HQ designation was based. The designated uses of streams within the South Fork Tenmile Creek basin, as with all surface waters, "are continuously evaluated and updated as part of the State's federally mandated water quality standards review" (PADEP 2003). An existing use determination is required to be made on a surface water whenever PADEP issues a permit or takes action on a

request to conduct an activity that may impact the surface water (PADEP 2003). In its review and approval of permit applications during the past three decades, PADEP consistently has used existing and readily available data on South Fork Tenmile Creek and its upstream waterways to reaffirm its HQ designation and to maintain and protect the HQ use of those waters. For example, according to a public notice published in the PaB on 16 October 1999 (for an NPDES permit renewal application to allow the West Greene School District to discharge treated sewage to Grays Fork), effluent limitations were imposed on the discharges because the receiving waters (Grays Fork) had "*existing and/or potential uses for aquatic life, water supply, and recreation.*" Clearly, these same uses applied to all of the streams in the South Fork Tenmile Creek basin upstream from its confluence with Browns Creek (including the subject tributaries). Just because *one* of those uses (water supply) may not currently be active does not mean the other uses are not applicable.

(iii) No Use Attainability Analysis has been prepared

The standards set forth in 25 *Pa. Code* §93.4(b) and (c), and the corresponding implementation guidance (PADEP 2003), establish a high burden for any Petitioner seeking to redesignate a stream to a less restrictive use. A key concept in assigning designated uses is "attainability," or the ability to achieve water quality goals under a given set of natural, human-caused, and economic conditions. Federal regulations create a rebuttable presumption in favor of established designated uses. Before a designated use can be lowered, a structured scientific assessment, known as a *use attainability analysis* (UAA), must be prepared [40 *C.F.R.* 131.3(g), 131.10(j)].

No Use Attainability Analysis has yet been prepared for the subject tributaries to SFTC by either the PADEP or the Petitioner.

In order to adopt a less restrictive designated use of a stream, PADEP must demonstrate (or the Petitioner must demonstrate and PADEP must concur) that:

(A) The designated use is more restrictive than the existing use, and

(B) The designated use cannot be attained by implementing effluent limits required under sections 301(b) and 306 of the Federal Clean Water Act, or by implementing cost-effective and reasonable BMPs for non-point source control, and

(C) One or more of the following six conditions exists:

(1) Naturally occurring pollutant concentrations (natural quality) prevent the attainment of the use;

(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated by the discharge of sufficient volume of effluent discharges (without violating State water conservation requirements) to enable uses to be met;

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate the modification in a way that would result in the attainment of the use;

(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life uses; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Federal Clean Water Act would result in substantial and widespread economic and social impact.

Neither the Petitioner nor PADEP has affirmatively made all of the necessary demonstrations listed above. Indeed, it is unlikely that any such demonstration could be made, given the existing high quality of the subject streams. The burden of proof that conditions warrant redesignation of the HQ-WWF use of these streams to a less restrictive WWF use clearly rests with the Petitioner. For the reasons set forth above, the Petitioner has not met and cannot meet this burden.

IX RECOMMENDATIONS

1) At a minimum, the current designated use of HQ-WWF for House Run, Hoge Run, and McCourtney Run should be retained and protected.

2) The current HQ-WWF existing use for sections of House Run, Hoge Run, and McCourtney Run should be acknowledged and established as the appropriate minimum level of protection to be maintained in all future PADEP permit evaluations.

3) The current EV existing use for certain sections of House Run, Hoge Run, and McCourtney Run that qualify based on recent in-stream documentation should be acknowledged by PADEP where applicable and established as the appropriate level of protection.

4) If PADEP believes that the Waynesburg water supply was a key factor in the original designation of the upper South Fork Tenmile Creek basin as HQ-WWF, it could specifically “delete” PWS as a use for House Run, Hoge Run, and McCourtney Run while maintaining their HQ designation for other uses, thereby clarifying the current situation. This has been done in many other instances, including for other streams designated as HQ-WWF. For example, Squaw Run and Guyasuta Run, both third-order tributaries of the Allegheny River in Allegheny County (Chapter 93 Drainage List U) have the following designated use: “Water Uses Protected”: *HQ-WWF; Delete PWS*. This likewise could apply

to the subject tributaries in the upper South Fork Tenmile Creek watershed. The Petitioner, however, has not presented any substantive case for specifically deleting PWS as a designated use for the Petition Area streams, and there is no reason for EQB to do so.

5) Given the recent (2008) upgrading by PADEP to EV existing use of UNT North Fork Dunkard Fork and UNT Owens Run from TSF and WWF, respectively, and the identification by Stout (2009) of three to five more stream reaches in and near the Petition Area as having EV existing use, PADEP should undertake new stream inventory/assessments in the upper SFTC watershed to identify additional EV streams.

6) Prior to any decisionmaking on discharges or encroachments on any streams in Greene County, PADEP should require detailed inventory of stream biota to establish the correct existing use and to enable imposition of appropriate controls to prevent stream degradation.

7) Given the existence of localized nonpoint sources of pollution in the SFTC watershed, PADEP, the Greene County Conservation District, and other entities should undertake outreach to provide assistance in implementing BMPs, especially in Environmental Justice Areas.

X CONCLUSIONS

House Run, Hoge Run, and McCourtney Run were designated HQ-WWF in 1979. The proposed redesignation to WWF is unnecessary, inappropriate, unwarranted, and would be contrary to law. Specific in-stream biological data collected by Dr. Stout document that most sections of the three streams are meeting at least HQ criteria; some sections of the waterways currently are meeting EV criteria. Representative in-stream data collected and evaluated by PADEP during the past three decades consistently demonstrated that the upper reaches of South Fork Tenmile Creek (including the subject streams) were meeting their designated HQ uses according to the methods and standards in place at the times of evaluation. The implementation of cost-effective and reasonable BMPs for nonpoint source control could provide the necessary water quality improvements, so that sections of the subject waterways that may not currently be meeting HQ criteria could once again achieve at least HQ conditions. Headwater streams such as these play a crucial role in maintaining and protecting the quality of downstream waterways. Redesignation to WWF would allow additional discharges which likely would preclude any water quality improvements in these streams in the future, could affect species of special concern, and could endanger the quality of HQ waters downstream. For all of these reasons, the HQ-WWF designation of House Run, Hoge Run, and McCourtney Run at minimum must be retained. Segments of these watersheds should be redesignated to EV wherever appropriate to recognize and protect their existing biological conditions.

XI AUTHORSHIP

This report was compiled by Stephen P. Kunz and James A. Schmid, senior ecologists with Schmid & Company, Inc. Mr. Kunz has been a consulting ecologist since receiving a degree in human ecology from Rutgers University in 1977. Dr. Schmid is a biogeographer with 40 years of experience in ecological consulting. Both Mr. Kunz and Dr. Schmid have been certified as *Wetland Delineators* by the Army Corps of Engineers. Both are certified as *Senior Ecologists* by the Ecological Society of America and as *Professional Wetland Scientists* by the Society of Wetland Scientists.

Dr. Schmid and Mr. Kunz offer outstanding credentials as experts in ecology, wetlands, environmental regulation, and impact assessment. They have analyzed the environmental impacts of many kinds of proposed development activities in 10 states, including coal mining facilities, industrial facilities, transportation facilities, commercial developments, and residential developments. They have written Environmental Impact Statements under contract to the United States Environmental Protection Agency, Army Corps of Engineers, Interstate Commerce Commission, various agencies of state and local governments, and a diverse array of private sector entities. They have prepared comprehensive analyses of environmental regulations of nationwide scope.

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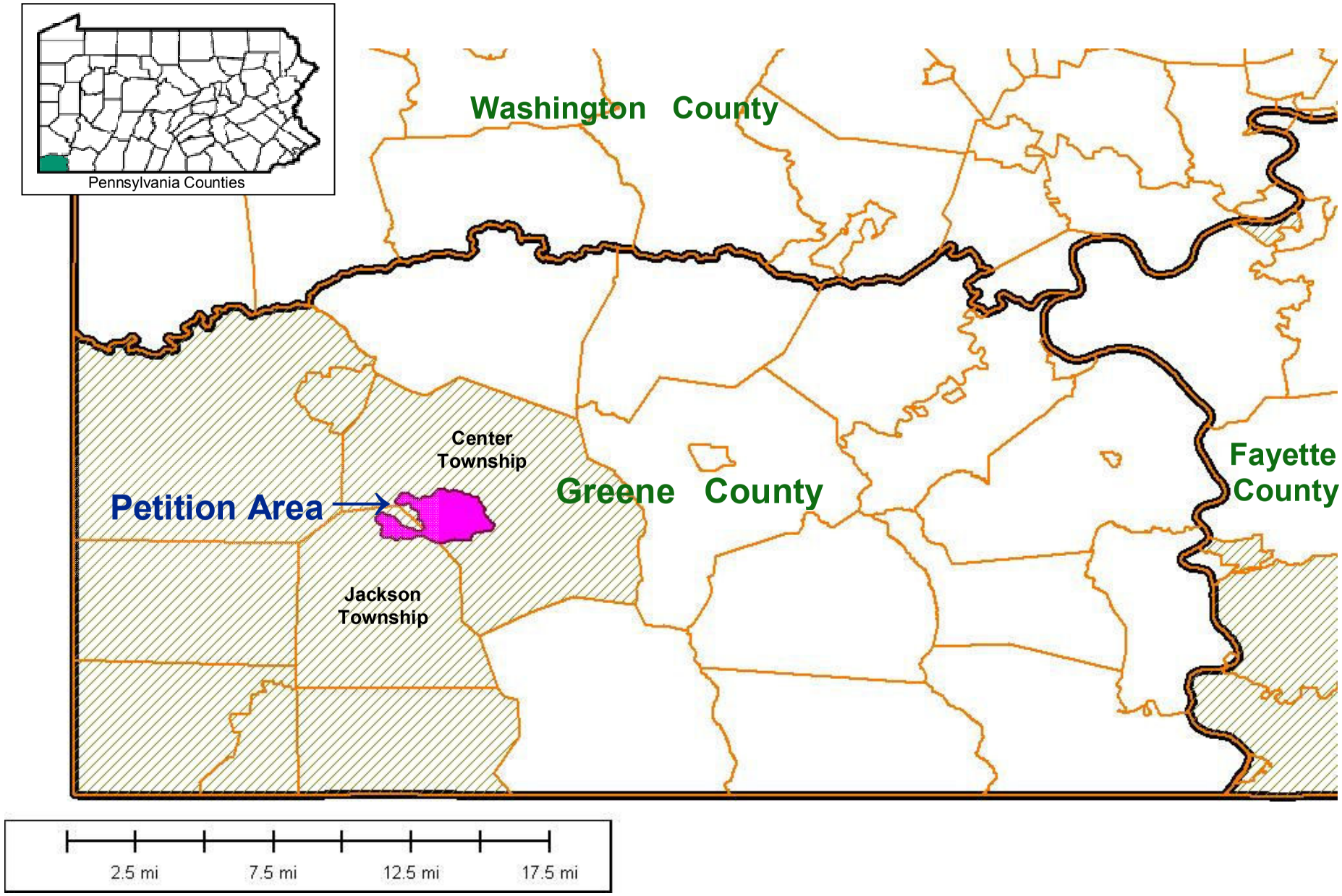

FIGURE 1. Location of the Petition Area (purple shading) in Greene County, Pennsylvania, in the southwestern corner of Pennsylvania (inset). Municipal boundaries are in brown, Environmental Justice Areas are cross-hatched.

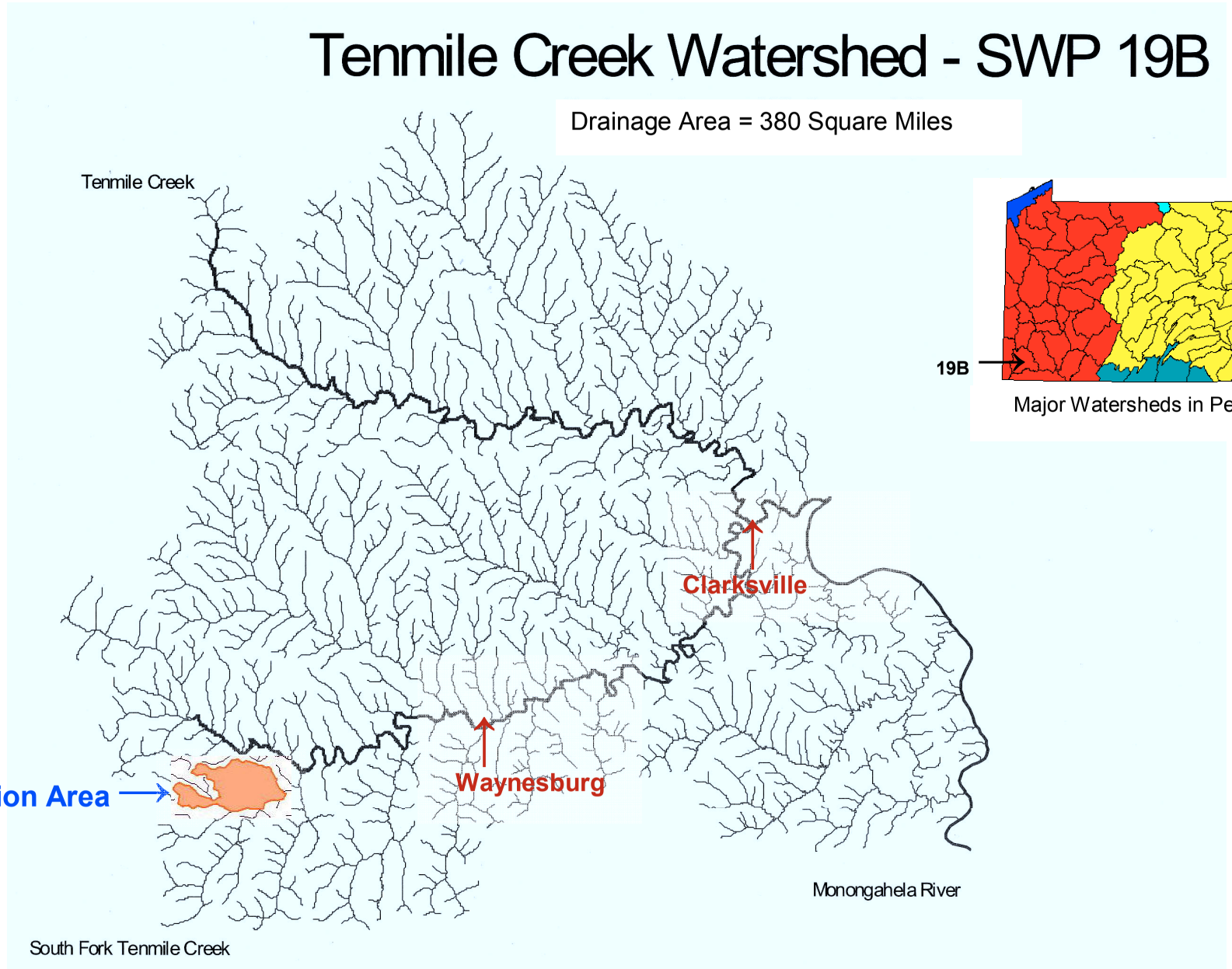

FIGURE 2. Location of the Tenmile Creek watershed (PA SubBasin 19B), including the upper South Fork Tenmile Creek basin in which is located the Petition Area (shaded, at arrow). Tenmile Creek flows into the Monongahela River (Ohio River Basin, red in inset) in southwestern Pennsylvania.

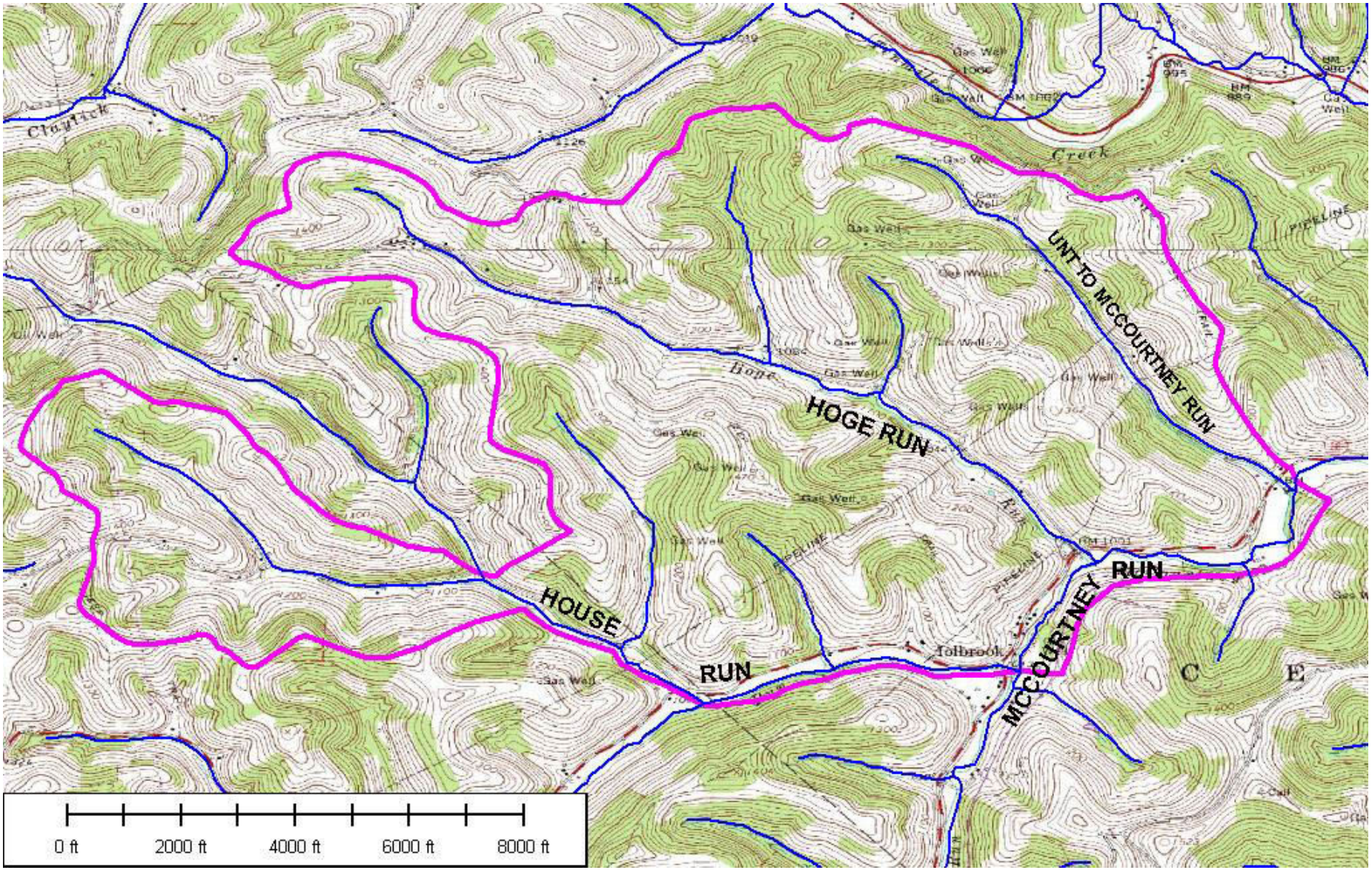

FIGURE 3. Location of the 2,462-acre Foundation Petition Area (purple outline) and streams (blue) as depicted on the Holbrook and Rogersville USGS topographic quadrangles.

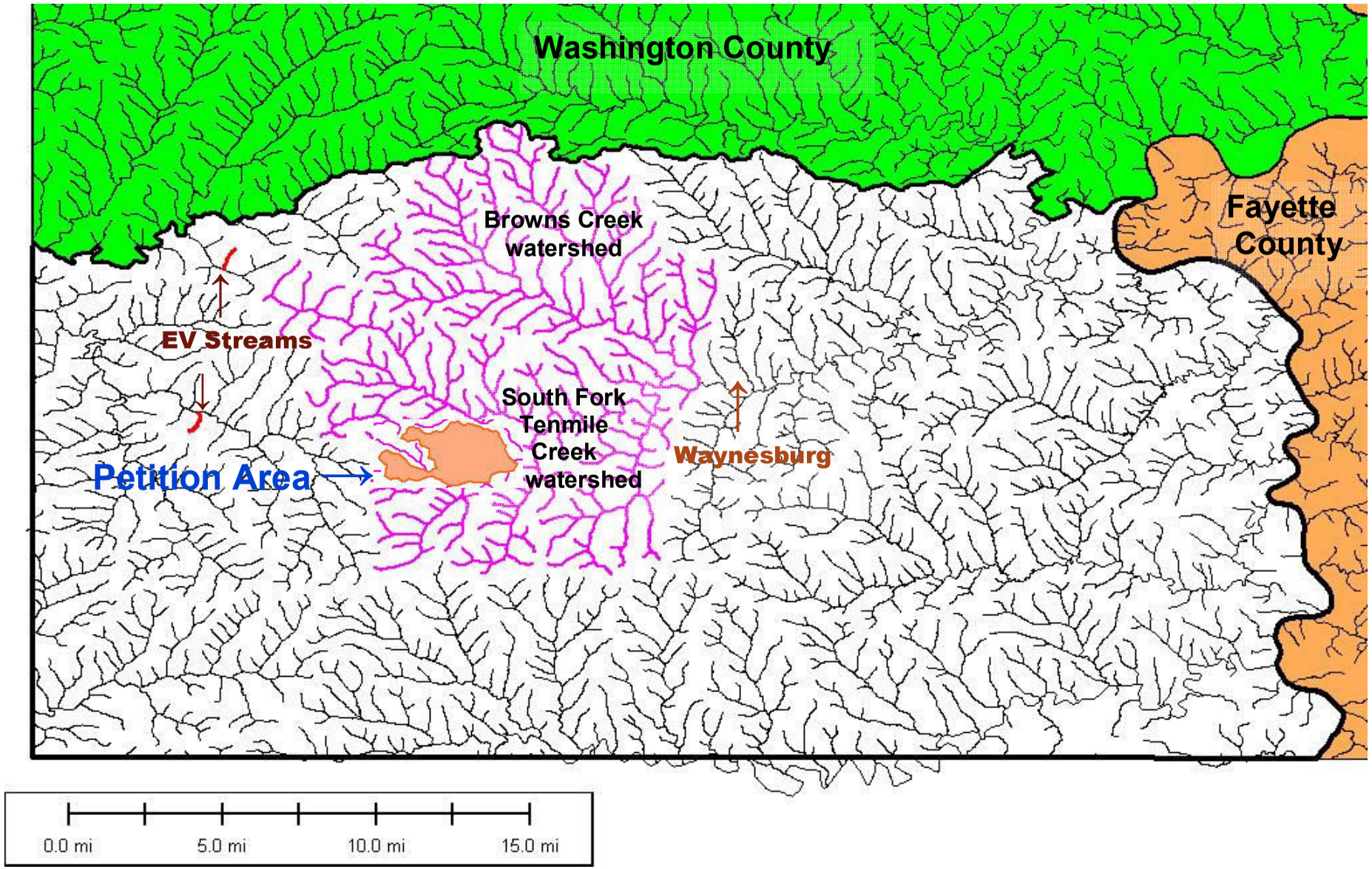

FIGURE 4. Identification of stream networks in Greene County and nearby vicinity. The streams of the South Fork Tenmile Creek basin and the adjacent Browns Creek basin, which are the only ones in the County that are designated HQ-WWF, are shown in purple. Petition Area is noted at arrow. Two streams recognized as EV in 2008 in northwestern Greene County are shown in red (see also Figure 8).

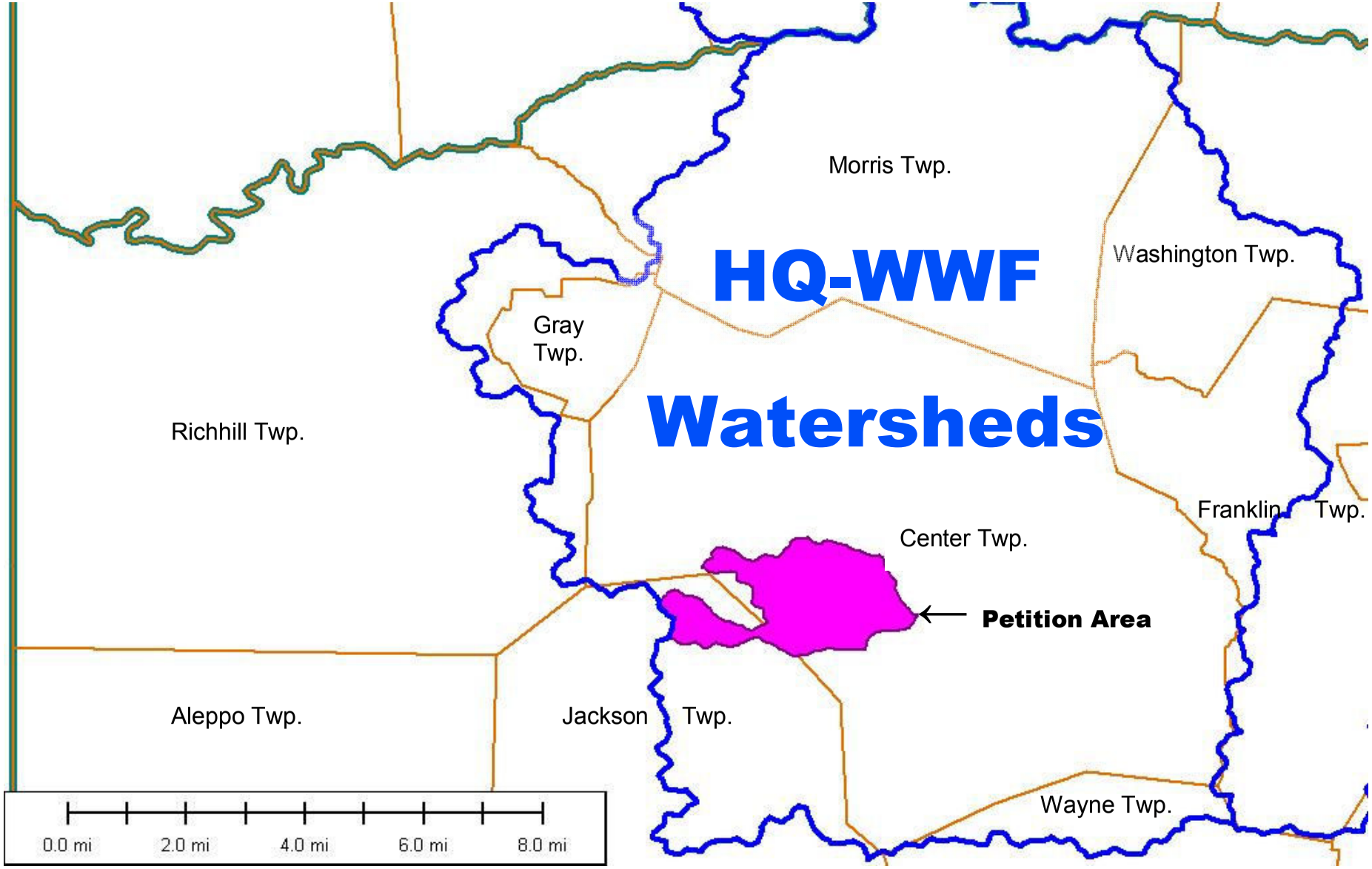

FIGURE 5. Location of the Foundation Petition Area (purple shading at arrow) in relation to nearby municipalities in central Greene County within the South Fork Tenmile Creek and Browns Creek watersheds designated "HQ-WWF".

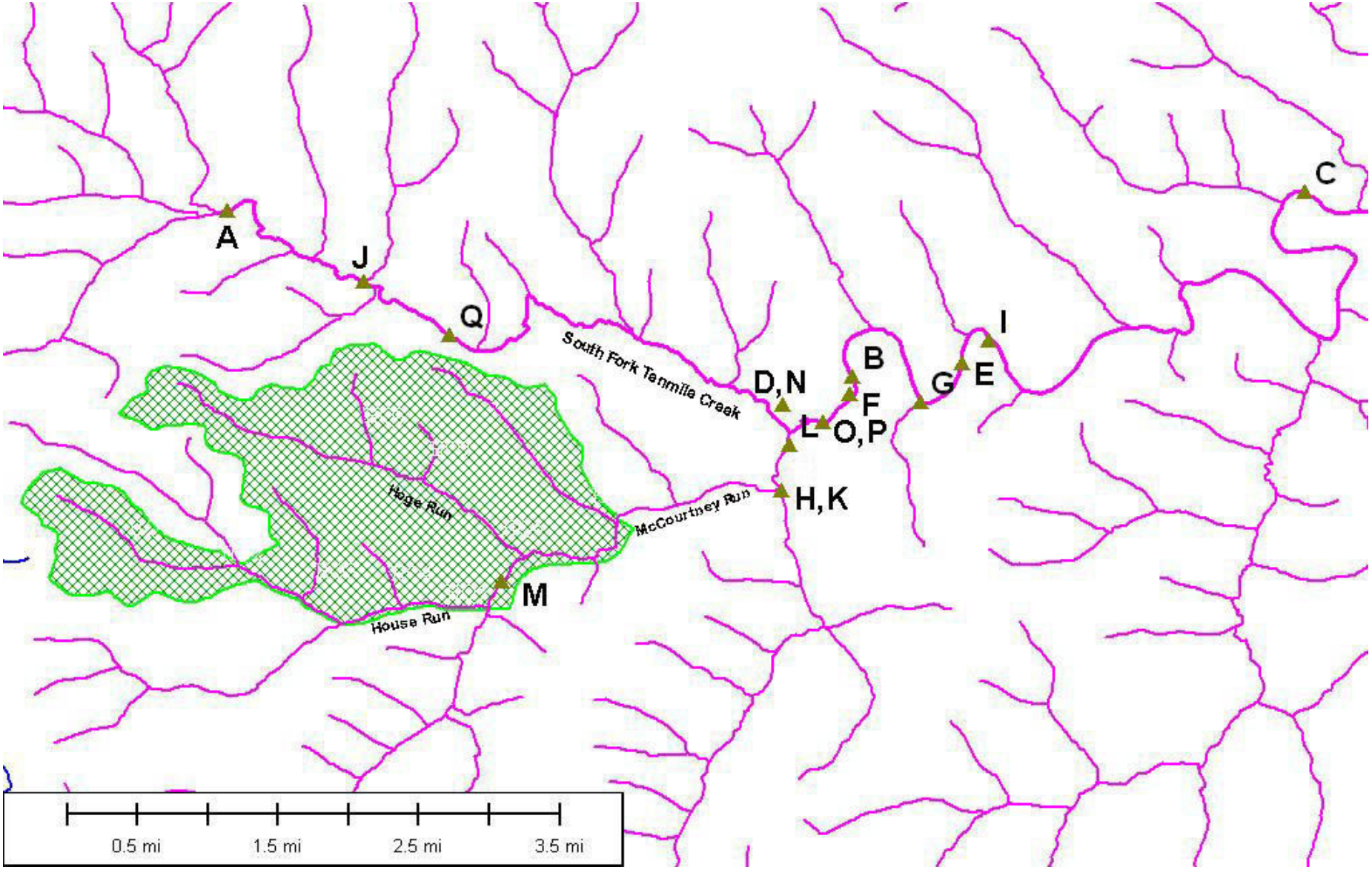

FIGURE 6. Location of HQ-WWF streams (purple) in the upper South Fork Tenmile Creek basin in the vicinity of Foundation Petition Area (green cross-hatch) showing seventeen PADEP stream assessment sampling locations (A through Q); 1972-2006 summary data for each station are provided on Table 1.

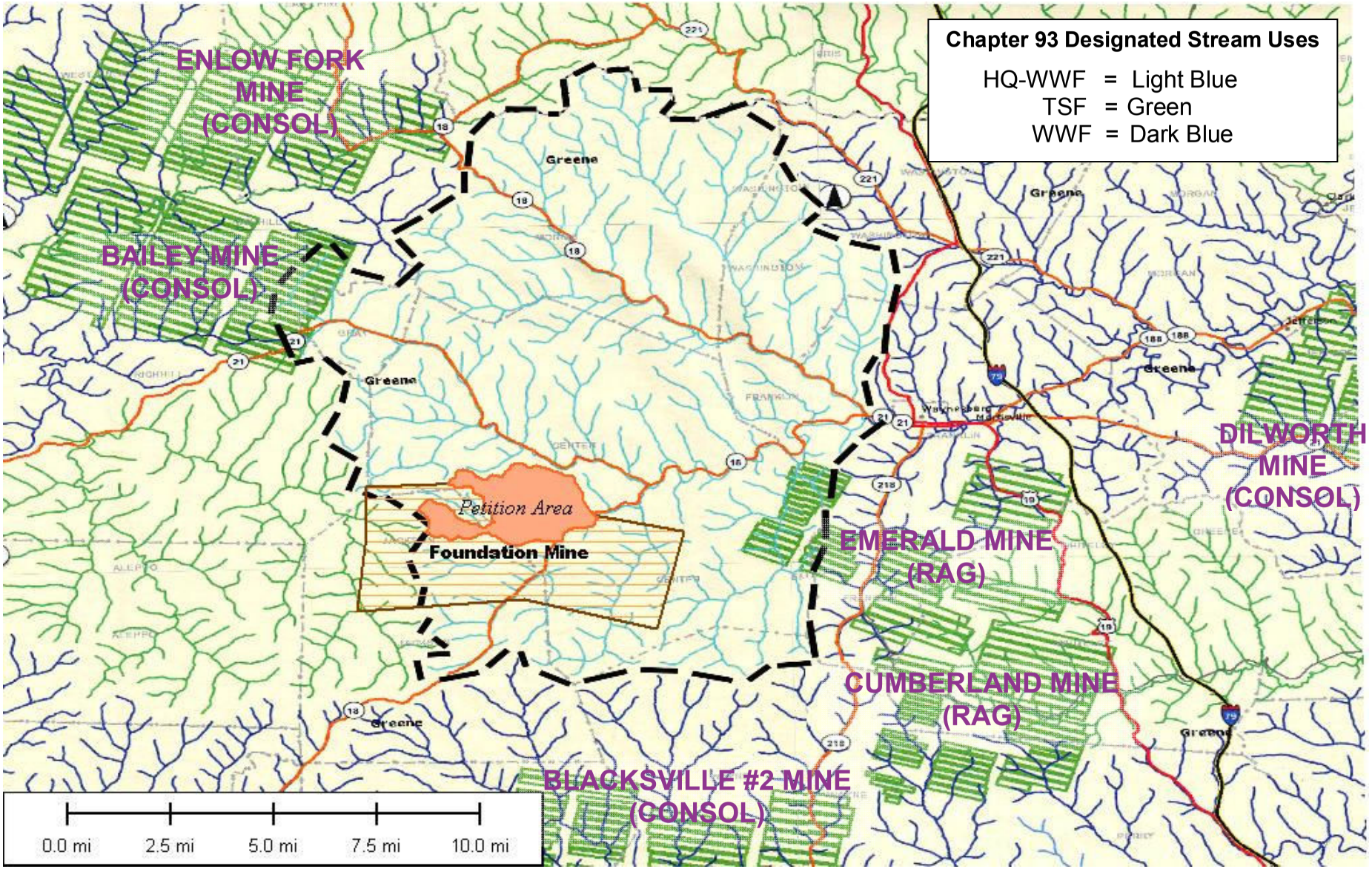

FIGURE 7. Location of proposed Foundation Mine (horizontal hatching) and the Petition Area (shaded peach) in relation to HQ-WWF watersheds in Greene County (light blue streams within black dashed outline) and existing underground longwall mine panels in the vicinity (rectangular green). Basemap is from DEP's eMapPA website (PADEP 2008c). Designated stream uses are noted.

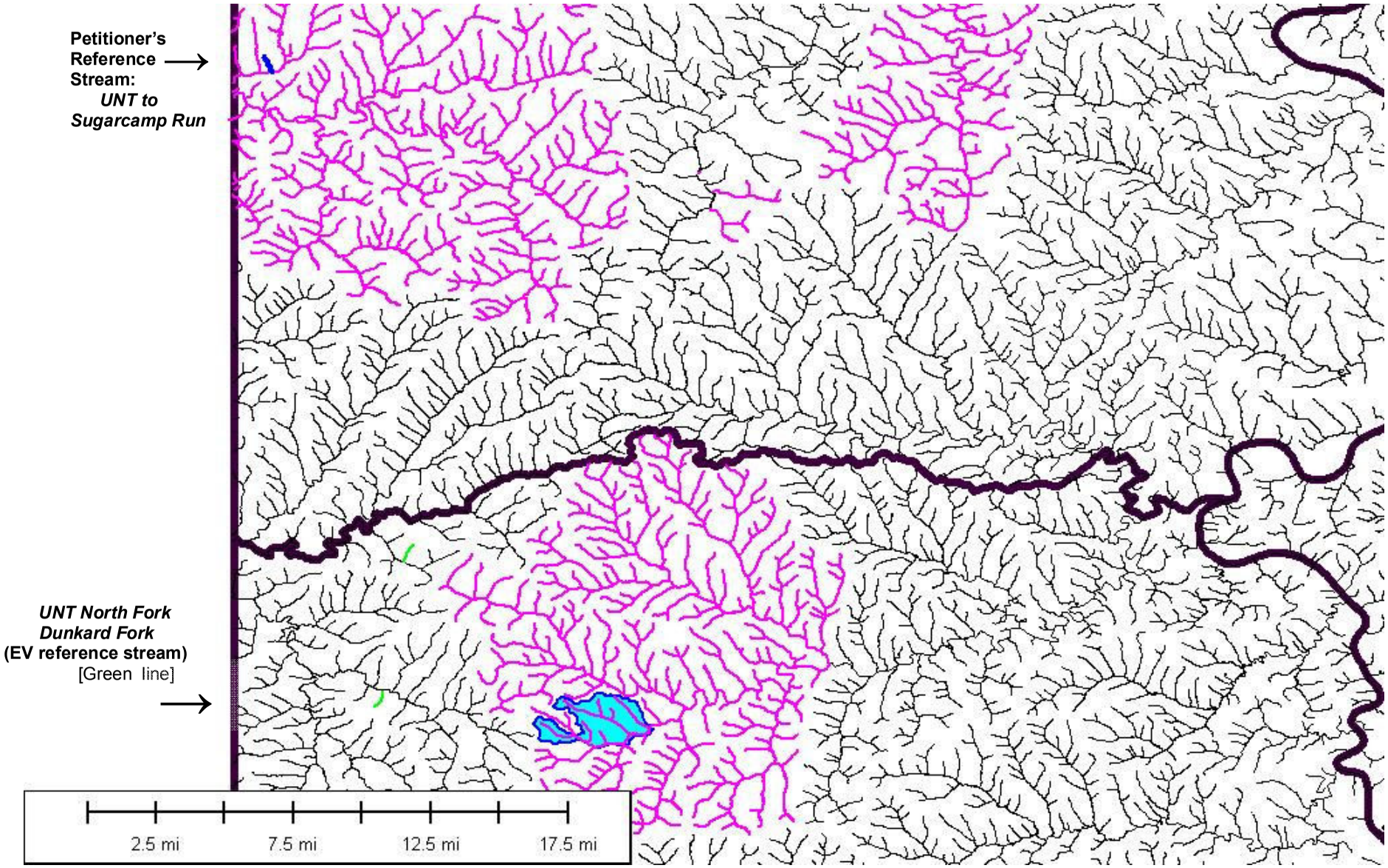

FIGURE 8. Location of Petition Area (blue shading) in South Fork Tenmile Creek watershed in Greene County relative to the Petitioner's selected reference stream (blue, upper left), approximately 25 miles to the northwest, and the UNT North Fork Dunkard Fork (EV reference stream), about 6 miles to the west. County boundaries are dark black. HQ-WWF streams are shown in purple; EV streams are in green; other streams are shown in black.

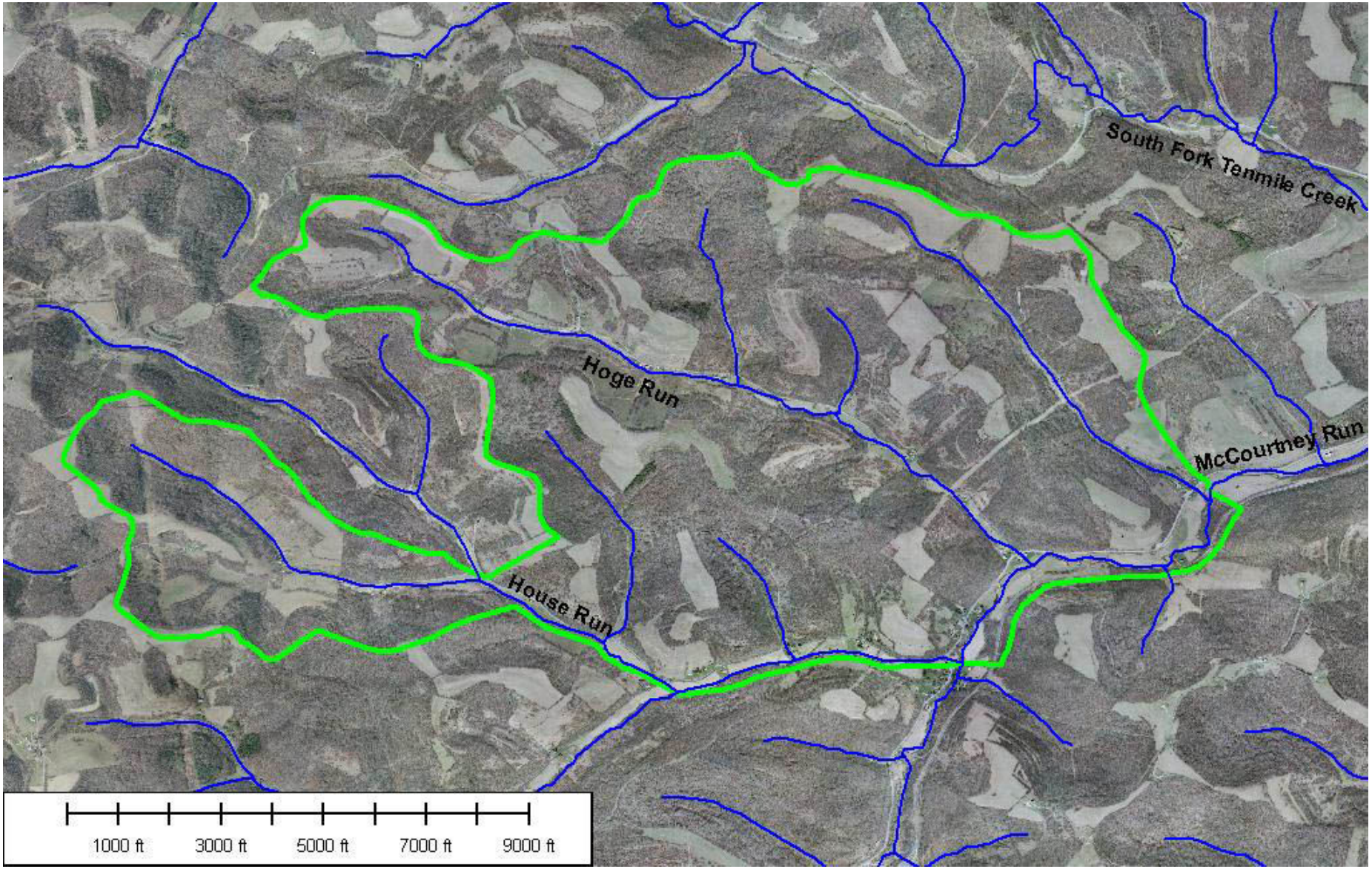

FIGURE 9. Location of Foundation Petition Area (green outline) and Hoge Run, House Run, McCourtney Run, and other nearby streams (blue lines) as depicted on an aerial photograph taken during 2003. The Petition Area is primarily woodland (77%) and farmland (22%), according to the Petition filed with the EQB during June 2008 (Wallace & Pancher, Inc. 2008b).

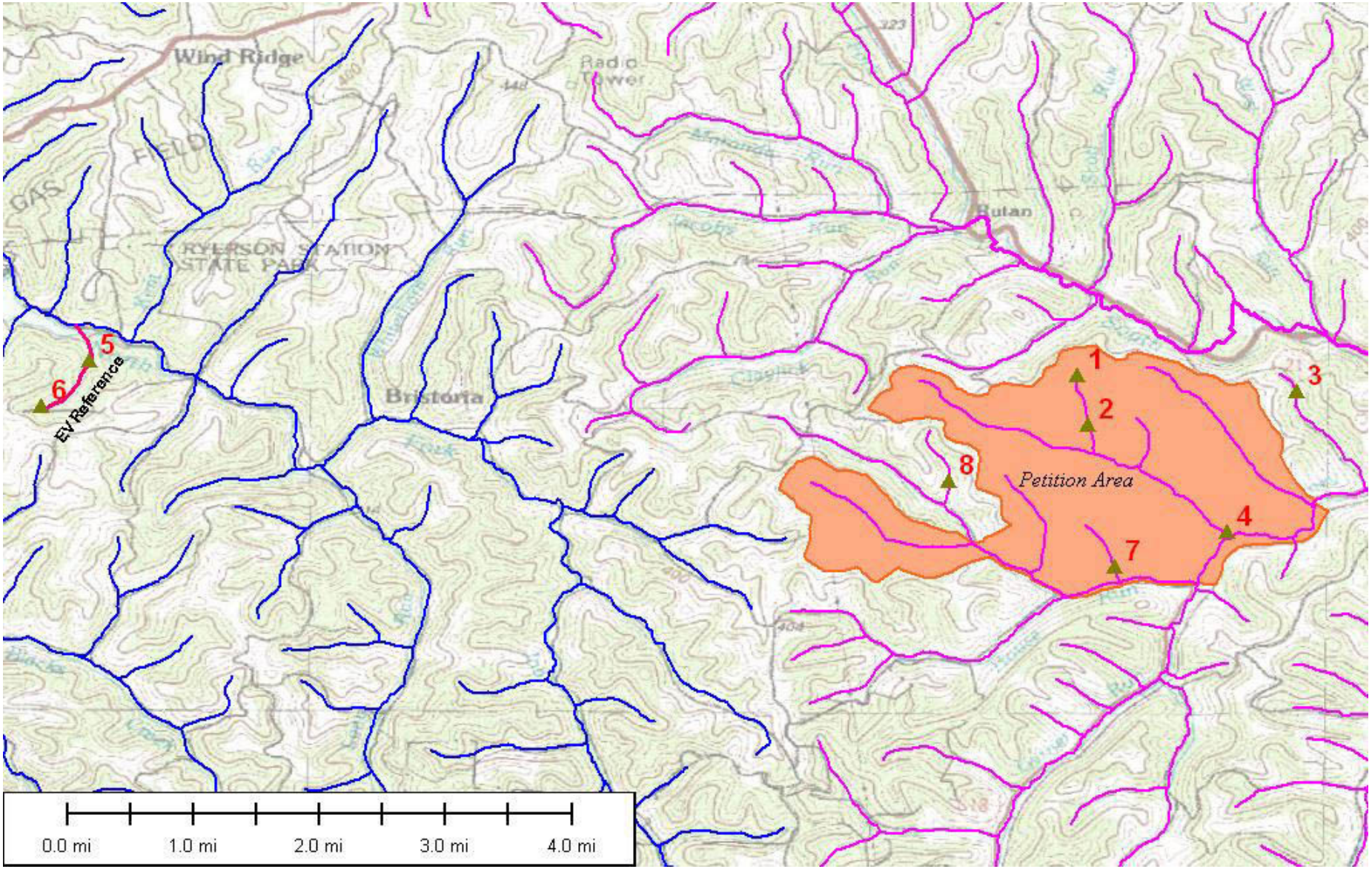

FIGURE 10. Location of Foundation Petition Area (peach shading) and Dr. Stout's sampling locations, including two (5 and 6) along UNT North Fork Dunkard Fork, an EV Reference stream (in red). HQ-WWF streams are shown in purple, TSF streams are shown in blue.

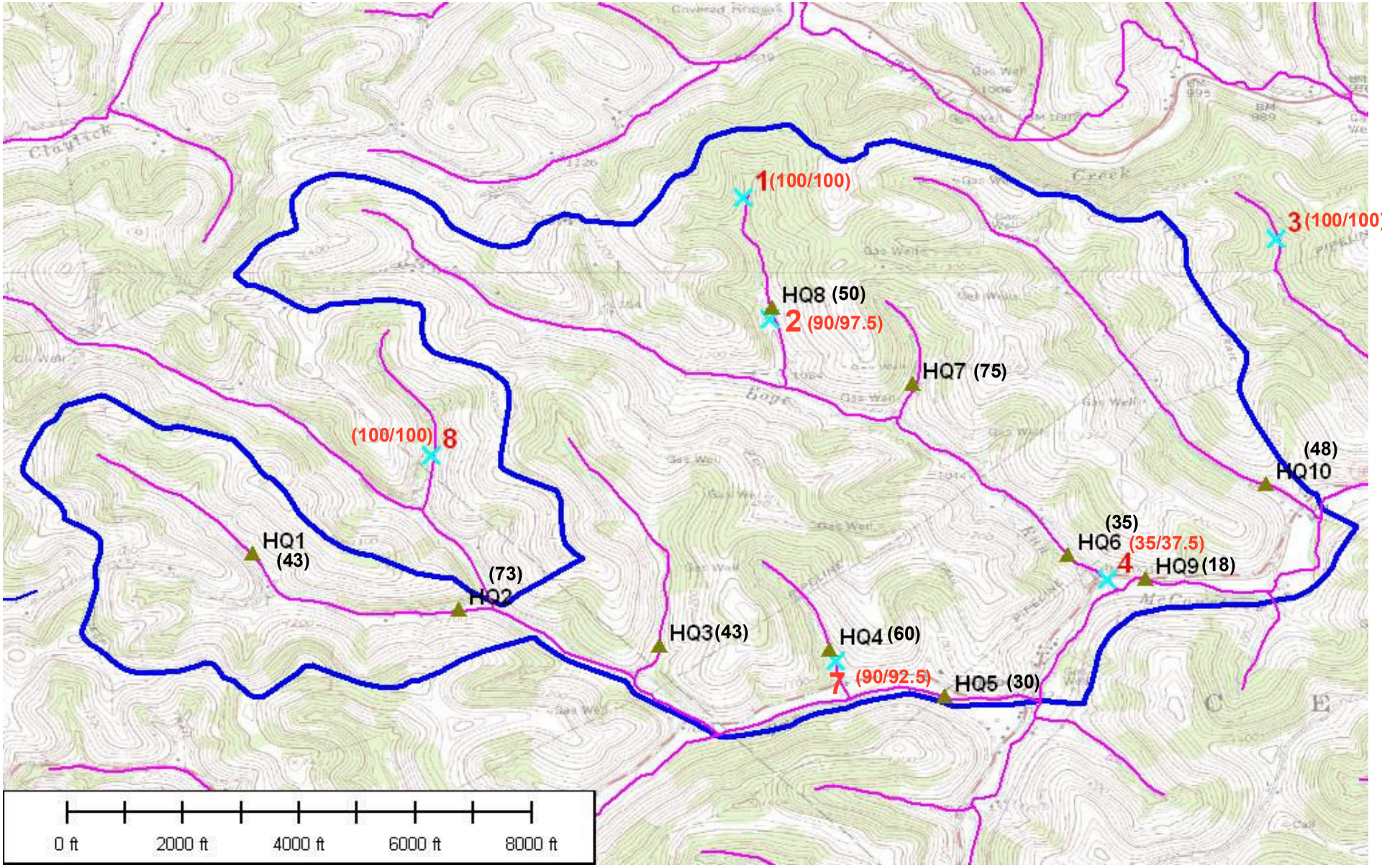

FIGURE 11. Location of Foundation Petition Area (blue outline) showing Petitioner's 2008 sampling locations (green triangles black numbers HQ1 through HQ10) and Dr. Stout's 2009 sampling locations (blue Xs, red numbers 1-4, 7, 8). The HQ-WWF streams in the vicinity are colored purple. Basemap is the USGS topographic map. Scoring percentages (in parentheses) for each station versus selected reference stream are noted (with Dr. Stout's being referenced to both Station 5/Station 6; Petitioner's scores are referenced to 2005 data collected along UNT to Sugarcamp Run in Washington County).

Table 1. PADEP water quality sampling data for various stations within the upper South Fork Tenmile Creek basin. Locations are depicted on Figure 6.

MAP ID	***DATE***	***SAMPLE TYPE***	***LOCATION***	***METHODS***
A	27-28 Sept. 1972	Invert., chem	STA 1: Upstr. at Rutan, Rt 21 near T750	
(Results: "A diverse macroinvertebrate community was observed. Water quality was good.")				
	10 April 1973	Invert., chem	STA 1: Upstr. at Rutan, Rt 21 near T750	
(Results: "Distribution and abundance of macroinvertebrates revealed an extremely diverse and balanced aquatic community was present. Sensitive taxa dominated the collection. Measured chemical parameters were all well within the ranges recommended for preservation of aquatic life.")				
B	27-28 Sept. 1972	Invert., chem	STA 2: Just upstr of Rogersville, below Rts 18 and 21	
(Results: "A healthy macroinvertebrate community was encountered. Density and diversity were sufficient. Chemistry similar to STA 1.")				
	10 April 1973	Invert., chem	STA 2: Just upstr of Rogersville, below Rts 18 and 21	
(Results: "Community diversity and measured chemistry similar to STA 1. Excellent water quality conditions were observed.")				
C	27-28 Sept. 1972	Invert., chem	STA 3: East View, upstr. from T537 bridge, nr. Rt 18	
(Results: "Macroinvertebrate community structure similar to STA 2, although diversity slightly lower. Chem. acceptable for aquatic life.")				
	10 April 1973	Invert., chem	STA 3: East View, upstr. from T537 bridge, nr. Rt 18	
(Results: "No noticeable change in either biological or chemical characteristics was evident. No obvious stream degradation has occurred to this point.")				
D	20 October 1983	Invert., fish, chem	Above Rogersville (upstream), below Rts 18/21	
E	20 October 1983	Invert., fish, chem	Below Rogersville (downstream), below Rts 18/21	
(Results: A healthy invertebrate community. Fishes also abundant. Nothing of concern chemically. The SFTC has excellent water quality and supports an abundant and diverse invertebrate community and fishery. It deserves its special protection status.")				
F	8 July 1987	fish	Above Rogersville (upstream), off Rt T511	
G	8 July 1987	Fish	Below Rogersville (downstream), at baseball field	
(Results: sewage discharges at Rogersville have no effect on stream as large as SFTC. "There is no way to justify a severe effect.")				

Table 1. Sampling data for upper South Fork Tenmile Creek basin streams (continued)

MAP ID	***DATE***	***SAMPLE TYPE***	***LOCATION***	***METHODS***
H	13 May 1999	Invert+phys	STA 11 (ID44020), Hargus Ck. nr McCourtney Run	
(Results: Total score: 144, "not impaired", stoneflies collectively present, 6 or more families with Hilsenhoff 4 or less)				
I	20 July 2001	Invert+phys (fish, chem.)	Below Rogersville (downstream) at cemetery	
(Results: Total score: 177 "High diversity & abundance")				
J	20 July 2001	Invert+phys	STA 23 (ID48685), E of Rutan, covered Br.	
(Results: Total score: 167; "not impaired", dominated by families with mean Hilsenhoff of 5 or less)				
K	31 July 2001	Invert+phys	STA 26 (ID48778), Hargus Ck. nr McCourtney Run	
(Results: Total score: 170; "not impaired", dominated by families with mean Hilsenhoff of 5 or less, 6 or more families with Hilsenhoff 4 or less)				
L	31 July 2001	Invert+phys	STA 27 (ID48780), Hargus Ck. nr SFTC	
(Results: Total score: 155; "not impaired", dominated by families with mean Hilsenhoff of 5 or less)				
M	31 July 2001	Invert+phys	STA 28 (ID48784), upper McCourtney Run	
(Results: Total score: 175; "not impaired", dominated by families with mean Hilsenhoff of 5 or less, 6 or more families with Hilsenhoff 4 or less)				
N	31 July 2001	Invert+phys	STA 29 (ID48788), SFTC nr Hargus Ck.	
(Results: Total score: 165; "not impaired", dominated by families with mean Hilsenhoff of 5 or less)				
O	31 July 2001	Invert+phys	STA 30 (ID48790), SFTC nr Hargus Ck.	
(Results: Total score: 158; "not impaired", dominated by families with mean Hilsenhoff of 5 or less)				
P	31 July 2001	Invert+phys (fish, chem.)	Above confluence w/McCourtney Run	
(Results: Total score: 165 "Many fish species in run & pool.")				

Table 1. Sampling data for upper South Fork Tenmile Creek basin streams (concluded)

MAP ID	DATE	SAMPLE TYPE	LOCATION	METHODS
Q (WQN #731)				
	14 August 1998	Macroinvertebrates	STA 731 (ID42615), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 120, Hilsen: 5.83, %EPT: 29, Taxa R: 14, FCPRSH: 7, Beck3: 1, Beck4: 4, Mod%EPT: 3, %Dom: 53, Shan:1.69)			
	20 Nov. 1998	Macroinvertebrates	STA 731 (ID43325), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 119, Hilsen: 3.85, %EPT: 91, Taxa R: 13, FCPRSH: 6, Beck3: 2, Beck4: 9, Mod%EPT: 55, %Dom: 31, Shan:1.95)			
	22 March 1999	Macroinvertebrates	STA 731 (ID43600), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 59, Hilsen: 5.49, %EPT: 61, Taxa R: 15, FCPRSH: 7, Beck3: 2, Beck4: 7, Mod%EPT: 10, %Dom: 29, Shan:2.20)			
	11 August 1999	Macroinvertebrates	STA 731 (ID45163), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 120, Hilsen: 5.47, %EPT: 81, Taxa R: 12, FCPRSH: 7, Beck3: 1, Beck4: 5, Mod%EPT: 6, %Dom: 40, Shan:1.88)			
	25 October 1999	Macroinvertebrates	STA 731 (ID45540), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 120, Hilsen: 5.35, %EPT: 70, Taxa R: 11, FCPRSH: 5, Beck3: 1, Beck4: 5, Mod%EPT: 16, %Dom: 36, Shan:1.77)			
	28 March 2001	Macroinvertebrates	STA 731 (ID47617), betw. Rutan and Rogersville	6-D, 200
	(Results: Total orgs: 230, Hilsen: 4.21, %EPT: 11, Taxa R: 17, FCPRSH: 9, Beck3: 0, Beck4: 5, Mod%EPT: 1, %Dom: 55, Shan:1.68)			
	18 July 2001	Macroinvertebrates	STA 731 (ID47617), betw. Rutan and Rogersville	6-D, 200
	(Results: Total orgs: 212, Hilsen: 5.39, %EPT: 20, Taxa R: 18, FCPRSH: 7, Beck3: 6, Beck4: 9, Mod%EPT: 4, %Dom: 44, Shan:1.70)			
	1 August 2001	Invert+phys	STA 31 (ID44861), betw. Rutan and Rogersville	
	(Results: Total score: 160; “not impaired”, dominated by families with mean Hilsenhoff of 5 or less)			
	25 October 2001	Macroinvertebrates	STA 731 (ID49182), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 120, Hilsen: 5.70, %EPT: 23, Taxa R: 15, FCPRSH: 6, Beck3: 7, Beck4: 9, Mod%EPT: 13, %Dom: 48, Shan:1.84)			
	25 October 2001	Macroinvertebrates	STA 731 (ID49183), betw. Rutan and Rogersville	6-D, 200
	(Results: Total orgs: 215, Hilsen: 5.63, %EPT: 25, Taxa R: 18, FCPRSH: 9, Beck3: 8, Beck4: 10, Mod%EPT: 10, %Dom: 46, Shan:1.93)			
	7 May 2003	Macroinvertebrates	STA 731 (ID49182), betw. Rutan and Rogersville	2-D, 100
	(Results: Total orgs: 300, Hilsen: 5.39, %EPT: 41, Taxa R: 19, FCPRSH: 6, Beck3: 7, Beck4: 12, Mod%EPT: 39, %Dom: 25, Shan:2.11)			
	25 July 2006	Macroinvertebrates	STA 731 (ID55338), betw. Rutan and Rogersville	6-D, 200
	(Results: Total orgs: 300, Hilsen: 5.39, %EPT: 41, Taxa R: 19, FCPRSH: 6, Beck3: 7, Beck4: 12, Mod%EPT: 39, %Dom: 25, Shan: 2.11)			