

**UNNAMED TRIBUTARY SCHUYLKILL RIVER
(SPRING MILL RUN)**

MONTGOMERY COUNTY

WATER QUALITY STANDARDS REVIEW

STREAM REDESIGNATION REPORT

**Segment: Basin
Stream Code: 00926
Drainage List F**

**WATER QUALITY MONITORING SECTION (APF)
DIVISION OF WATER QUALITY STANDARDS
BUREAU OF WATER STANDARDS AND FACILITY REGULATION
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

JUNE 2007

INTRODUCTION

The Unnamed Tributary (UNT) Schuylkill River (locally known as Spring Mill Run) is currently designated Warm Water Fishes (WWF) and was evaluated for a redesignation based on a petition submitted to the Environmental Quality Board on April 18, 2003 by Steven S. Brown, Chairman of the Whitemarsh Township Environmental Advisory Board. The petitioner requested the WWF designation of the stream reach from Cedar Grove Road crossing downstream to the mouth be changed to "at least CWF" or the preferred High Quality-Cold Water Fishes (HQ-CWF) or Exceptional Value Waters (EV) designation on the basis of the stream's resident aquatic life. The Department evaluated the entire basin during field surveys conducted on October 22, 2003 and April 12 and 16, 2004 (Table 1, Figure 1). Spring Mill Run had been surveyed previously by DEP Regional staff in February 1997, June 2002, and August 2003.

GENERAL WATERSHED DISCRIPTION

Spring Mill Run is a tributary to the Schuylkill River. The basin is located in Whitemarsh Township, Montgomery County. Spring Mill Run is a limestone-influenced creek that drains 2.5mi² and flows in a southerly direction. The surrounding area is characterized by relatively hilly topography, which is portrayed on the Norristown 7.5-minute series USGS quadrangle map.

Land use in the watershed is dominated by urban (consisting of both high and low density, residential areas), commercial, industrial uses, and a golf course. Most of the stream's riparian zone is forested. The watershed is within the Piedmont Upland and Carbonaceous ecoregion. The National Wetlands Inventory maps indicate forested/shrub, riverine, and freshwater emergent wetlands may be present.

WATER QUALITY AND USES

Surface Water

No long-term water quality data were available to allow a direct comparison to water quality criteria. The Department collected field water chemistry data at station 2-SM (Table 2) on October 22, 2003 and April 12, 2004. Since the instantaneous nature of grab samples precludes comparison to applicable water quality criteria, the indigenous aquatic community is a better indicator of long-term conditions and is used as a measure of the ecological significance.

There are no National Pollution Discharge Elimination Systems (NPDES) permitted discharges within the Spring Mill Run basin. There are two ground water withdrawals and one ground water recharge discharge (all related to the same golf course), within the study area.

Aquatic Biota

Department staff collected habitat and benthic macroinvertebrate data at one sampling location on October 22, 2003 and two locations on April 14 - 16, 2004.

Habitat. Instream habitat conditions were evaluated at the same reach where benthic macroinvertebrates were sampled (Table 3). The habitat evaluation consists of rating twelve habitat parameters to derive a station habitat score. The habitat scores for Spring Mill Run equaled 163 to 188; reflecting sub-optimal to optional habitat conditions.

Benthos. Benthic macroinvertebrate collection efforts employed the Department's PA-DEP RBP benthic sampling methodology, which is a modification of EPA's Rapid Bioassessment Protocols (RBPs; Plafkin, et al 1989; Barbour et al. 1999). The results of the benthic macroinvertebrate sampling efforts are presented in Table 4. Taxonomic diversity was limited (ranging from 3 to 6 total taxa per station) and was dominated by the genus *Gammarus*, a common inhabitant of limestone-influenced spring-fed streams. The majority of the organisms present are classified as pollution tolerant.

Fish. The Department collected fish samples from station 2-SM on August 15, 2003, and June 17, 2004. This data is presented along with that collected from 1-SM and 1A-SM on February 18, 1997 and June 28, 2002 in Table 5.

A total of 13 different species have been captured during these surveys. All samples were dominated by slimy sculpins, a cold water species often found in cool spring-fed streams. Brown trout were also captured on 2 occasions. One of the brown trout appeared to be from hatchery origin (eroded dorsal fin and partially regenerating pectoral fins) while the other trout appears to be stream-bred (eroded fin characteristics of hatchery-reared trout were not observed and parr marks were present). Several warmwater species were also collected on these sampling dates. These species are likely transients from the Schuylkill River.

BIOLOGICAL USE QUALIFICATIONS

The biological use qualifying criteria applied to Spring Mill Run was the integrated benthic macroinvertebrate score test described at § 93.4b(a)(2)(i)(A) and § 93.4b(b)(1)(v) following the Department's Antidegradation protocol. This Antidegradation protocol requires that selected benthic macroinvertebrate community metric scores from a candidate stream be compared to those from an Exceptional Value (EV) reference station (Table 4). The reference station was located on Elk Creek (Centre County). Elk Creek was selected as a reference stream because it is a limestone-influenced stream that is designated EV in Chapter 93. All sampling for comparison was done over a two-week period to minimize the effects of seasonal variation. This comparison was done using metrics that were selected as being indicative of aquatic community health: taxa richness; modified EPT index (total number of intolerant Ephemeroptera, Plecoptera, and Trichoptera taxa); modified Hilsenhoff Biotic Index; percent dominant taxon; and percent modified mayflies.

Based on these five metrics, all stations on Spring Mill Run had biological condition scores less than 83% of the reference station on Elk Creek. This indicates that Spring

Mill Run does not qualify for Special Protection designation under the Department's regulatory criterion (§ 93.4b(b)(1)(v)). No other Antidegradation qualifying requirements listed in §93.4b apply to Spring Mill Run.

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this aquatic life use evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on August 23, 2003 (33 Pa.B 4230). A similar notice was also published in the Norristown Times Herald on August 22, 2003. In addition, the Montgomery County Planning Commission, Borough of Conshohocken, and Whitemarsh Township were notified of the redesignation evaluation in a letter dated August 22, 2003. There was no additional information provided in response to the public notice.

The Spring Mill Run report and original recommendations (June 2007) to redesignate the stream as Cold Water Fishes (CWF) were made available for public review and comment on DEP's web page. The local stakeholders, which included the petitioner, White Marsh Township, the Montgomery County Planning Commission, and the Montgomery Conservation District, were notified of the web report availability by postal mail. No comments were received in response to this web posting.

RECOMMENDATIONS

Based on applicable regulatory definitions and requirements of §93.4(b) the Department recommends that the Spring Mill Run basin from its source to mouth be redesignated to Cold Water Fishes (CWF). This recommendation is based on the cold water fish populations that are found in Spring Mill Run. This recommendation is consistent with the petitioner's request for an "at least CWF" classification but short of their preferred HQ-CWF or EV request. The redesignation to CWF affects approximately 2.4 miles of streams.

REFERENCES

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water; Washington, D.C.
- Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. Environmental Protection Agency, Office of Water Regulation and Standards, Washington, D.C. EPA 440-4-89-001.

TABLE 1

**STATION LOCATIONS
SPRING MILL RUN, MONTGOMERY COUNTY**

<u>STATION</u>	<u>LOCATION</u>
1-SM	Spring Mill Run approximately 300 m upstream SR 3059 Bridge. Lat: 40.0782 Long: -75.2833 RMI: 0.4
1A-SM	Spring Mill Run approximately 100 m upstream of SR 3059 Bridge. Lat: 40.0773 Long: -75.2827 RMI: 0.3
2-SM	Spring Mill Run along approximately 200 m upstream of confluence with Schuylkill River Lat: 40.0744 Long: -75.2848 RMI: 0.1
Ref1	Elk Creek along T863 in Miles Township, Centre County. Lat: 40.9209 Long: -77.4803 RMI: 4.7

TABLE 2.
WATER CHEMISTRY
SPRING MILL CREEK, MONTGOMERY COUNTY
ELK CREEK, CENTRE COUNTY

Station	Field Parameters		
	2-SM		Ref1
	Date	10/22/2003	4/12/2004
Temp (°C)	11.78	11.86	10.96
pH	7.06	7.64	6.73
Cond (umhos)	476	498	238
Dissolved O ₂ (mg/l)	8.87	9.96	10.66
Alkalinity (mg/l CaCO ₃)	180	200	100

TABLE 3.
HABITAT ASSESSMENT SUMMARY
SPRING MILL CREEK, MONTGOMERY COUNTY
ELK CREEK, CENTRE COUNTY

HABITAT PARAMETER	scoring range	Candidate Stations			Reference Station
		1-SM	2-SM		Ref1
		4/16/2004	10/22/2003	4/12/2004	4/21/2004
1. instream cover	0 - 20	16	13	14	16
2. epifaunal substrate	0 - 20	14	14	15	18
3. embeddedness	0 - 20	15	12	14	16
4. velocity/depth	0 - 20	14	14	14	16
5. channel alterations	0 - 20	16	11	11	19
6. sediment deposition	0 - 20	13	10	10	18
7. riffle frequency	0 - 20	17	15	17	17
8. channel flow status	0 - 20	18	19	19	18
9. bank condition	0 - 20	14	14	15	18
10. bank vegetation protection	0 - 20	17	15	16	18
11. grazing/disruptive pressures	0 - 20	12	15	11	18
12. riparian vegetation zone width	0 - 20	19	11	10	19
Total Score	0 - 240	185	163	166	211
Rating		Optimal/ Suboptimal	Suboptimal	Suboptimal	Optimal

TABLE 4.
BENTHIC MACROINVERTEBRATE DATA
SPRING MILL, MONTGOMERY COUNTY
ELK CREEK, CENTRE COUNTY

	Candidate Stations			Reference Station
	1-SM	2-SM		Ref1
	4/16/2004	10/22/2003	4/12/2004	4/21/2004
<u>MAYFLIES</u>				
Baetidae <i>Baetis</i>	4	3	-	22
Ephemerellidae <i>Drunella</i>	-	-	-	5
<i>Ephemerella</i>	-	-	-	114
<i>Serratella</i>	-	-	-	1
Heptageniidae <i>Epeorus</i>	-	-	-	2
Leptophlebiidae <i>Paraleptophlebia</i>	-	-	-	6
<u>STONEFLIES</u>				
Nemouridae <i>Amphinemura</i>	-	-	-	3
Perlodidae <i>Isoperla</i>	-	-	-	1
<u>CADDISFLIES</u>				
Brachycentridae <i>Micrasema</i>	-	-	-	2
Hydropsychidae <i>Cheumatopsyche</i>	-	-	-	5
<i>Hydropsyche</i>	-	-	-	16
Odontoceridae <i>Psilotreta</i>	-	-	-	1
Rhyacophilidae <i>Rhyacophila</i>	-	-	-	1
<u>TRUE FLIES</u>				
Chironomidae	1	4	7	8
Simuliidae <i>Simulium</i>	-	-	-	1
Tipulidae <i>Antocha</i>	-	-	2	-
<i>Tipula</i>	-	1	-	-
<u>MISC. INSECT TAXA</u>				
Elmidae <i>Optioservus</i>	-	-	-	3
<i>Promoresia</i>	-	-	-	6
<u>NON-INSECT TAXA</u>				
Planariidae	-	1	-	-
Oligochaeta	-	1	-	-
Gammaridae <i>Gammarus</i>	269	180	208	1
Hydracarina	-	-	-	2
Total Taxa	3	6	3	19

TABLE 5.
FISH¹
SPRING MILL CREEK, MONTGOMERY COUNTY

Fish Species	Station					
	1-SM	1A-SM	2-SM			
	2/18/1997	2/18/1997	2/18/1997	6/28/2002	8/15/2003	6/17/2004
<i>Salmo trutta</i> , brown trout	-	-	-	R ²	R ³	-
<i>Cottus cognatus</i> , slimy sculpin	P	VA	VA	A	A	VA
<i>Semotilus atromaculatus</i> , creek chub	P	-	R	-	-	-
<i>Cyprinella analostana</i> , satinfish shiner	C	C	-	-	-	-
<i>Luxilus cornutus</i> , common shiner	P	R	P	-	-	-
<i>Pimphales notatus</i> , bluntnose minnow	R	-	-	-	-	-
<i>Catostomus commersoni</i> , white sucker	-	R	R	-	R	-
<i>Lepomis x</i> , sunfish hybrid	-	R	R	P	P	C
<i>Lepomis cyanellus</i> , green sunfish	R	R	-	R	-	P
<i>Lepomis gibbosus</i> , pumpkinseed	-	-	-	R	-	-
<i>Lepomis macrochirus</i> , bluegill	-	R	P	-	-	A
<i>Micropterus dolomieu</i> , smallmouth bass	-	-	-	-	R	-
<i>Micropterus salmoides</i> , largemouth bass	-	-	-	-	-	R
TOTAL TAXA	6	7	6	5	5	6

¹ - Occurrence: R - rare (<3), P - present (3-9), C - common (10-24),
A - abundant (25-100), VA - very abundant (>100)

² - Trout appeared to be of hatchery origin and one other trout was seen but not captured.

³ - Trout appeared to be stream-bred

TABLE 6.
RBP METRIC COMPARISON
SPRING MILL CREEK, MONTGOMERY
ELK CREEK, CENTRE COUNTY

Station #	CANDIDATE STATIONS		REFERENCE STATION
	1-SM	2-SM	Ref1
METRIC	4/16/2004	4/12/2004	4/21/2004
1. TAXA RICHNESS	3	3	19
Candidate/Reference (%)	15.8%	15.8%	--
Biological Condition Score	0	0	--
2. MODIFIED EPT INDEX	0	0	10
Candidate/Reference (%)	0.0%	0.0%	--
Biological Condition Score	0	0	--
3. MODIFIED HBI	4.04	4.06	2.41
Candidate - Reference	1.63	1.65	--
Biological Condition Score	0	0	--
4. % DOMINANT TAXA	98.2	95.9	57
Candidate - Reference	41.20	38.9	--
Biological Condition Score	0	0	--
5. % MODIFIED MAYFLIES	0	0	64
Reference - Candidate	64.00	64.00	--
Biological Condition Score	0	0	--
TOTAL BIOLOGICAL CONDITION SCORE	0	0	--
% COMPARABILITY TO REFERENCE	0%	0%	--